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ABSTRACT

The Higher Education Colloquium is composed of individuals who have made significant contributions to American higher education as researchers, college or university administrators, foundation executives, or in other roles. These proceedings include the following: recognition of the efforts and excellence of Ruth E. Eckert; "New Tasks for New Times: The Changing Role of the College Teacher," by Ruth E. Eckert; recognition of the efforts and excellence of Ralph Tyler; "Can a University Determine Its Future," by Ralph W. Tyler; and "Research-Based Decision Making in Higher Education: Possibility or Pipe Dream," by Alexander W. Astin. The membership of the colloquium and its steering committee are listed. (LBH)

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PROCEEDINGS OF THE

HIGHER EDUCATION COLLOQUIUM

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THE HIGHER EDUCATION COLLOQUIUM

The Higher Education Colloquium is composed of individuals who have made significant contributions to American higher education as researchers, college or university administrators, foundation executives, or in other roles. Evidence of scholarly contribution is required for membership, which is limited to fifty individuals.

The program of the Colloquium includes two meetings per year, each of which focuses upon some current issue in higher education. These sessions have regularly been scheduled just preceding the American Council on Education annual meeting and the AAHE National Conference on Higher Education.

In 1970, the Colloquium initiated a program for recognition of individuals who have made outstanding contributions to higher education over a span of years. Persons recognized thus far are Drs. T. R. McConnell, Algo Henderson, Earl McGrath.

Introduction and Recognition of Ruth Eckert

G. Lester Anderson

It is appropriate to honor Ruth at this meeting of the Colloquium as it has assembled in connection with the American Council's annual meeting with its theme: "Women in Higher Education." It is appropriate because Ruth is the first lady among students of American higher education.

It would be demeaning to Ruth and unbecoming for this body if Ruth were being honored simply because of the ACE theme. Ruth has earned this honor because of her continuing and distinguished study of higher education and her teaching and leadership roles in higher education. Her work has spanned a third of a century. Ruth is not simply the first lady among higher education scholars; she has perhaps served longer in her accepted role without diversion than any other person, man or woman.

Ruth grew up in Buffalo and earned her first degree at the University of Buffalo in 1930. Buffalo cannot make claims of great distinction through the years, but those of us who know the history of our field are familiar with the work that has been done at Buffalo in studying higher education and the names which have been associated with this effort. Samuel Paul Capen was Chancellor at Buffalo in the 1920's and 1930's. He had come there from distinguished leadership in Washington, where he had been Assistant Commissioner for Higher Education in the U.S. Office (then Bureau) of Education and then first director of the American Council. It is not a mere coincidence that two of the few persons honored by this Colloquium were graduates of Buffalo in the Capen era--Earl McGrath and now Ruth Eckert. Ruth's first published work was in higher education and was done at Buffalo. She published with Edward S. Jones and Henry C. Mills, both early scholars

of higher education, in 1933, 1934, 1935, and then in 1936 a monograph of her own, The Selction of Students for Anticipatory Examinations, Volume 13, in the University of Buffalo Studies. She, with Jones, Mills, and others, was working in the area of college credit for high school work, advanced placement, and allied areas for twenty years before the Ford Foundation discovered and supported this area of research. Other influences at Buffalo, primarily that of L. O. Cummings, Dean of the School of Education there, caused her to go to Harvard where she earned her doctorate under Truman Kelley.

Ruth had been a research associate at Buffalo from 1931-36 working on General Education Board financed studies of comprehensive college examinations and of the superior student. From 1935-37 she was a staff associate for the Regents' Inquiry into the cost and character of Secondary Education, and in 1937-38 she was with the Cooperative Test Service in New York. As a staff associate for the Regents' Inquiry, she co-authored with Thomas O. Marshall, When Youth Leave School (McGraw-Hill, 1939).

Then, in 1938 Ruth went to or came to Minnesota. Minnesota has probably had a longer record of sustained study of higher education than any other university. It began in the early twenties when Lotus Coffman formed the University Committee on Educational Research and made Melvin Haggerty chairman. The famous study, "Class Size at the College Level," was but one of the earlier committee sponsored studies. The names of those associated with Minnesota and higher education as a field of study down the years include those of Alvin Eurich, T. R. McConnell, Wesley Peik, Stuart Chapin, Russell Cooper, Horace Morse, Palmer Johnson, Robert Pace, Robert Keller, and John Stecklein. But of this list, Ruth's name must lead all the rest--arriving there in the late '30's and still productive at Minnesota in 1972, 34 years later. Her first book after arriving at Minnesota was Outcomes of General

Education, 1943, an evaluation of Minnesota's General College. Her publication list of books, monographs, reports, tests, journal articles, and commissioned papers numbers well over 100. They deal with planning, evaluation, curriculum, faculty personnel, university organization, students, teacher education. Ruth's work has touched almost every significant area of higher education.

But Ruth has not been a recluse scholar--she was one of the pioneers who organized the substantive aspects of higher education into a field of study. She has guided 49 students through their dissertation research for the Ph.D. degree in higher education and expects eight others to finish under her before her retirement next June.

She wrote to me when arrangements for this meeting were being made as follows: "[Those] who were recognized at past sessions [were and are] high level planners . . . heavily involved in national studies and developments, whereas my work has been of a much more modest variety--primarily as a teacher . . . in developing courses and sequences in higher education, as graduate adviser . . . and as a person who has kept a continuing hand on institutional and regional studies." Her recital is accurate but not complete. Ruth is a modest person, but her work is of no modest variety. She has been at work on the national level. I have mentioned her early staff service on the Regents' Inquiry of 1933-37 and that she co-authored one of the volumes produced by this inquiry; she was part of a team which surveyed the New York City Colleges (now City University) in 1943; she was twice elected to the Board of AAHE; she has been committee member, staff associate, consultant or officer to the National Society of College Teachers of Education, the National Advisory Committee on Presbyterian Colleges, the Educational Testing Service, the Educational Policies Commission of the NEA, the United States

Office of Education, the American Association of University Professors, and the North Central Association of Colleges and Secondary Schools.

Tonight we do honor to the first lady among students of American higher education--Ruth E. Eckert.

NEW TASKS FOR NEW TIMES
THE CHANGING ROLE OF THE COLLEGE TEACHER

Ruth E. Eckert

When Paul Dressel wrote me about the Colloquium Committee's decision to honor me at its fall dinner, I was both surprised and deeply pleased--the latter even more so because of the distinguished colleagues who made this selection. Though I am not retiring until June, I welcome this opportunity to sketch a few ideas distilled from many years' involvement in American higher education.

The reflections shared in this paper may be distinctive on two scores--as those of the first woman to be so honored and of a professor whose efforts have been chiefly centered at a single institution. Unlike the top-level administrators and regional and national planners previously recognized, my "platform" has usually been the classroom and seminar table. Hence, these remarks will be directed to a single point: the changing role of the college and university teacher and what this may require in substantially altered perspectives, policies, and practices.

I will first consider some current--and rather contradictory--views about college faculty members and their teaching roles, with a short analysis of how the latter have changed over the years. Principally this paper suggests personal characteristics and styles of operation suited to the new times and circumstances of higher education, and some ways of preparing and supporting faculty in their emergent roles.

Current Attention to College Teachers

Studying college teachers--and teaching--in the perspective of some four decades of personal observation, classroom experience, and research

yields two seemingly contradictory generalizations. In many ways the academic man--and belatedly, the academic women--has never had it so good. Salaries and fringe benefits have increased substantially, the "academic revolution" has brought our profession new power on the campus, and our involvements beyond academia have vastly widened. Although both students and the general public have recently lost some confidence in higher education, colleges and universities are still regarded as society's principal hope for coping with its massive present and oncoming problems. National surveys have also suggested that most students are reasonably satisfied with their educational experiences, as are the faculty with their own services.

Yet the faculty's chief activity--teaching--continues, in actual practice as distinguished from platitudinous endorsements, to be given scant recognition. In many quarters college faculty are being taken for granted--a price often paid for success. Although successive commissions, task forces, and super-boards have loudly affirmed this as "a time to upgrade the art of teaching," what this would involve has seldom been explored in any depth. Report after report has dealt with students' and institutional characteristics; but few have given more than passing mention to the half-million teachers' characteristics: their special backgrounds, incentives, loyalties, and conflicts. The Carnegie Commission, in its more than fifty published reports and studies, makes oblique references to staffing problems, but never has this been the central theme of a volume. Programs for disadvantaged students, innovative curricular plans, and the development of new technological hardware are dealt with in detail; these programs also have been receiving large financial underwriting from foundations and government agencies. But precious little has been invested

in trying better to understand academic men and women and their roles as planners, staff members, and appraisers of such innovative schemes.

Responsibility for this current neglect or disparagement of teaching rests to a large degree at our own doorsteps. Rarely do we discuss teaching in our faculty and other professional meetings or reward teaching competence in hiring or promoting staff. We have been content to expand programs by offering more of the same courses and kinds of teaching to a student body that is vastly larger and more diverse. We have also shied away from turning the spotlight of research on our own instructional efforts. From a half-century of narrowly conceived and disjointed studies little has been learned with which to meet assaults from critics who sometimes conclude by proposing a "deschooled society." While manufacturers and other special interest groups vigorously push development of auto-tutorial schemes, hardware and software of myriad varieties, and well-equipped learning centers as substitutes for many time-honored instructional roles, we can marshall little evidence to guide us in using these aids for different purposes, types of students, or varieties of subject matter. Seldom have we probed what really goes on in the teaching-learning "black box" or thought inventively about how faculty members' potential for teaching could be developed. The time has clearly come for strong assessment of <u>what</u> we know about college teachers and their instructional activities and of <u>how</u> these functions might be redefined to maximize students' learning.

Historical Roles of College Teachers

Roles are admittedly complex affairs, shaped for the most part by tradition and the expectations of those who perform or receive the services involved. During the past three centuries faculty roles vis-a-vis teaching

have altered markedly, with still greater changes in prospect.

For at least the first two hundred years of American higher education what the professor was and did was quite simple and easily understood. Mainly he functioned as a hearer of lessons and supervisor of students' conduct in and beyond the classroom. Although the student-faculty ratio was low, the flame of learning did not burn brightly in most teachers and apparently was seldom fanned in students. The really significant reforms came, not from within the profession, but from student protests and inexorable social changes.

With the growth of scholarly and scientific concerns in the nineteenth century, college teachers achieved the right not only to seek new knowledge but to teach freely whatever their studies and research had taught them. But the potential of the instructional innovations--lecturing, seminars, and laboratory approaches--was often unrealized by succeeding generations of teachers. Viewing themselves chiefly as men-of-knowledge, many became preoccupied with their own research or with purveying the fruits of other people's scholarship, without much vital linkage to students' concerns or learning efforts or to the insistent problems of the day.

Revolutionary changes in the world at large in recent decades--and to a lesser degree in higher education--need no documentation. Already suffering from "future shock," we must gird ourselves for far greater adjustments. Yet the policies and practices of college teachers have changed relatively little. Updated versions of the genial Mr. Chips or the superb scholar-lecturers whom many of us recall will clearly not suffice in the days ahead. Our urgent need is not to abolish schools and colleges but to staff them in ways that will assure students of a far better education than most now receive.

Proposals to change faculty roles are not meant to denigrate their past and current achievements, which have been substantial, nor to imply that conventional approaches to teaching are to be quickly displaced by different ones. Emerging non-traditional programs for the swelling number of "new students"--the academically and socially disadvantaged, those seriously disaffected or disillusioned with current approaches, and older persons--will undoubtedly require some radical adjustments in teaching style. Many conventional courses, too, will hopefully be restructured as more and more faculty members regard themselves as senior colleagues or catalysts for students' learning, rather than as the central actors in this drama. A variety of teaching styles will unquestionably be needed, to suit students' diverse backgrounds and purposes and the equally impressive differences in faculty talents. Carefully tested experiences as well as innovative approaches must be skillfully utilized in this "second great climacteric" period of American higher education.

Personal Characteristics of Effective Teachers

Distinguishing traits of good and poor teachers are difficult to identify since the general style or organization of these traits appears more crucial than any specific ones. But it is interesting to note that, in addition to demonstrated scholarly competence, superior teachers generally show personality traits that harmonize well with the college professor's emergent role as a senior partner or colleague in the learning process. Judging from studies by Gustad, Williams, Corcoran, and others, effective teachers tend to be more socially and theoretically oriented, more enthusiastic and flexible, more nurturant in their attitudes toward students, and better organized for their instructional tasks. Certainly they are far different sorts of persons than the custodian, preacher or therapist types ridiculed in Illich's scathing attack on current school and college staffs.

Accumulating evidence regarding the new students and the new demands they will impose on our colleges and universities suggests that the task of being a college teacher in the 1970's and '80's will be an even bigger one. Were a taxonomy of faculty characteristics to be developed along the Bloom-Krathwohl lines, it would undoubtedly show that faculty members, to fulfill their teaching roles in the years ahead, must generally know more, must feel or care more, and must do more than has been conventionally associated with their jobs.

To illustrate: teachers who expect to establish vital contacts with students will need to know more about themselves as growing persons, about contemporary students and their interests and needs for belonging, self-esteem and learning, and about how they can encourage and aid these quests, both in themselves and their students. Similarly, to feel or care more will require greater sensitivity to their own and their students' and colleagues' motivations and values, greater trust in their relationships with people, higher expectations that deep, authentic learnings will occur in their classes, and a rugged commitment to furthering liberal and humane values through their teaching. To do more, they must develop new skills in diagnosing, developing, and remediating tutorial and group processes. Moreover, they must demonstrate with their lives that they care enough about students to put their best imagination and efforts into their teaching and to take constructive social sections, instead of merely talking about ways of resolving some of man's perplexities and predicaments. The particular things they do may vary markedly: what is crucially important is that teachers be perceived by students as vital human beings, dedicated to their teaching role and willing to take meaningful risks to accomplish their mission.

Some Cardinal Tasks

Faculty members teach in a thousand different ways and appropriately so if these styles are geared to a considered philosophy of teaching, the students they actually have, and their distinctive backgrounds and interests. In any truly creative professional endeavor there will never be any one best pattern of service. But as the college teacher cares more for students as persons, he may be expected to function differently in at least four ways. Essential to all is a sharp break from the "hidden curriculum" that is rooted in the authoritarian nature of most current student-faculty contacts.

In a far deeper sense than his predecessors, the college teacher in these schemes must be a dreamer, or to borrow Jerome Bruner's provocative phrase, "a delineator of the possible." Because he has a deep intrinsic motivation to learn, as well as to help his students do this, he must constantly be exploring new paths to knowledge and intelligent action. Hence he reflects a good deal on why he is a teacher, what his field can mean for students, and how he can adapt his teaching to today's and tomorrow's imperatives. Such conceptualizing is not idle business, remote from real problems, but a productive way of becoming more understanding and resourceful in helping students to review their own purposes and to match these to what they can hopefully gain from particular courses, seminars, independent study, or community projects. It is no small task to dream up fresh ways of promoting development of each student's own intellectual and aesthetic uncommonness!

Also functioning to an unprecedented degree as a designer, the college teacher faces a far more difficult task than that of yesteryear. To avoid pre-packaged courses that assume uniformity in students' perspectives,

interests, and life goals, he must work closely with students and professional colleagues in defining goals and arraying opportunities that promise to broaden and deepen students' learning and to aid them in translating the resulting insights into their personal living. To select pertinent readings, films, and other learning aids, to develop thought-provoking problems or assignments, and to wrestle ingeniously with the other hard problems involved in instructional planning: these tasks and perspectives earmark the responsible designer of learning experiences. One major criterion of the excellence of such planning is the amount of room left for students to make choices and to steer their own course.

Spiraling changes in high school programs and far greater choices as to when, where, and how students will pursue their college studies enormously complicate such planning. Comprehensive testing programs and computer analyses can assist in matching experiences to students' different backgrounds but it is the faculty who must play a key role in minimizing an expensive duplication or discounting of students' prior learnings. Sequence in learning must also be planned for, as Gagne's experimental validation in several subject fields of a "knowledge hierarchy" convincingly demonstrates. But this again must be done in a creative, flexible manner which focuses not on meeting pre-determined "performance" standards but on cultivating each student's sense of initiative and responsibility for his own learning. Since many students today value concrete experiences more than reading and reflection, planning must also be directed toward helping them relate theory and action, an inescapable task in developing truly significant and durable insights.

Functioning also in the role of <u>developer</u>, or guide of the learning activities involved, what the teacher does here is more visible to students,

colleagues, and other concerned persons. Equally unacceptable, in translating the foregoing planning into action, are either the authoritarian or "director" model or the overly permissive type of instructor who resigns practically all responsibility for professional challenge or intervention. Since both freedom and reasonable constraints characterize any truly liberating experience, the skillful setting of these parameters calls for more, not less, vision and professional competence on the teacher's part.

Commitment to such a partnership or collegial role may be expressed in many ways--by sparking students' interest in the coming experiences, by encouraging them to ask their own questions and to define more precisely their problems, by needling or otherwise challenging them to examine biased views, by confronting them with issues and dilemmas that promote disciplined thinking, by helping them plan meaningful involvements with people and activities beyond the campus, by building on students' non-academic strengths rather than parading their scholastic weaknesses, and, above all, by offering a convincing model of how exciting the business of learning really is. In the "experimenting community" that Bilorusky has recently described, there must be a continuing dialogue between faculty advisers and students (sometimes also including other professional or community personnel), aimed at encouraging "script improvisation" as students gain new insights into their learning tasks. In short, this "developer" role will be best discharged by teachers who respect individual interests and talents and seek not conformity to their own values or standards, but students' full growth in wisdom and enlightened action.

To collaborate effectively in such a free-moving course of learning, the college teacher must also become skilled along still another line: as

a diagnoser or shared assessor of what goes on in the teaching-learning enterprise. Though students must assume considerable responsibility for defining the criteria used in evaluating their progress and for marshalling supporting evidence, professional expertise is also demanded in this complex task. Such appraisals will be aimed not at competitive grading but at providing informative feedback to sharpen both students' and teachers' efforts. For such a productive linkage of learning and evaluation, teachers need to become more knowledgeable about standardized tests and their uses and more inventive regarding other means of assessment. They must also learn to look reflectively at their own beliefs and feelings about teaching. As Peter Elbow, one of the 'new teachers' who contributed to Flournoy's recent volume, observed: "The main thing I've come to believe is that better teaching comes primarily from exploring one's own teaching from an experiential point of view.. What did I actually do? What was I actually experiencing when I did it? Why did I do it?" Such subjective analyses can be illuminating, but must be productively linked to students' appraisals, findings from broad-gauged testing programs, and continuing research if the teaching-learning process is to be significantly improved.

Some Recommendations

We shall never solve our staffing and teaching problems by the casual, half-hearted efforts made to date. Too long we have salved our consciences with token efforts, such as offering a graduate course or two on college teaching, specifying teaching competence as a desired characteristic for new faculty or offering "teacher of the year" awards. There are better ways to do this, with three broad directions of reform suggested here.

1. Developing greater openness to change. More important than specific steps will be a readiness to search for better solutions to our difficult staffing and teaching problems. We have been overly conservative, as a profession, in considering new approaches, with the result that reforms have been chiefly provoked by pressures from without or by administrators or students, not by college teachers themselves. To cultivate the open, accepting climate in which the innovative spirit thrives, the following steps seem imperative.

   a. Establish better communication networks, up and down and all across the campus and environing community, with probing study given to the where and why of "bottlenecks" in the flow of ideas.

   b. Set up environmental scanning units, to provide data to departments and other units on social trends relevant to their activities.

   c. Provide an "Information Central" office to which faculty can turn for help on questions about their own program or educational developments elsewhere.

   d. Collect and periodically discuss information on the "quality of life" in the institution, based on assessments of the learning climate and perceived satisfactions and dissatisfactions of students, faculty, and others in the academic community.

   e. Stimulate the search for ideas and materials that promise to make the teaching-learning experience truly exciting by making grants to persons who want to try new educational formats.

   f. Require all units, through a five per cent cutback in their funds every two or three years, to prune outdated courses and projects and to propose more strategic investments of the released funds, with these latter decisions made partly by departments and partly by college- and university-level groups.

   g. Demonstrate the "learning community" concept by greater trust and reciprocity in relations among faculty, students, administrators, and others involved in the program.

   h. Appoint and retain administrators who will exercise strong executive authority as change-agents for their institutions.

2. Preparing and supporting faculty in making these changes. Dreaming up new curricula or instructional approaches is not half as difficult as searching out and staffing them with competent, concerned persons. The lack of graduate schools, so devastatingly sketched in recent studies by Heiss, Alciatore, and others need no recounting, nor does the extensive evidence that faculty members

do not continue to grow as teachers, however impressive their other accomplishments. What is needed now is strong affirmative action. The following statements illustrate the many forms this might take.

a. Search out, during undergraduate and early graduate years, persons who should be encouraged to consider academic careers, with special emphasis on assisting promising women, members of minority groups, and economically disadvantaged students to enter the field.

b. Experiment more vigorously at the graduate level in preparing college teachers, involving top-flight staff members from two- and four-year colleges in this effort and according candidates the same prideful attention now given research-bound ones.

c. Diversify staff by more selective recruitment and retention of unusual people--both bold conceptualizers and competent performers in the fields involved--and then free them to develop and test their ideas.

d. Replace "training" and "inservice development" schemes which seek to build conformity to senior members' systems of values and interests with programs aimed at discovering young colleagues' real concerns and at marshalling resources to promote their professional growth.

e. Investigate faculty orientations toward roles, to see how these differing outlooks relate to teaching competence, scholarly productivity, and public service. Also urgently needed are studies of the "new teachers" who are staffing non-traditional programs and of the aging patterns of college faculty.

f. Reduce the "deadwood" problem by keeping older faculty personally involved in activities which underscore both the importance of teaching (such as conferences, visits to programs elsewhere, participation in experimental projects, and greater financial and psychological reward for teaching excellence) and the fact that changes are possible.

3. Testing the worth of these developments. The fact that many noteworthy practices introduced thirty or forty years ago are still confined to occasional institutions and that others have subtly eroded, as Johnstone's study shows, to the point where few distinctive features remain, suggests how feeble or totally lacking were efforts to ascertain their real worth. We know enough--and have instruments enough--to make these hard assessments; what is needed is the stubborn will to get or agree to be a party to the necessary evidences and to guide our decisions accordingly. Promising steps in this direction may include the following.

a. Be more ingenious in assessing students' achievements, supplementing tests of cognitive outcomes with "logs," students' files of evidence, reports by participant observers, and unobtrusive measures of various sorts.

b. Push development of oral, written, and performance tests that probe students' ability to stake out new directions and do not merely rely on conventional paradigms to solve problems.

c. Launch efforts to chart students' development before, during, and after their college experience, using perhaps Chickering's "seven vectors" or Loevinger's or Kohlberg's "stages of development" for this purpose.

d. Provide evaluation specialists to help both students and faculty understand better their own learning styles and to devise appropriate means of judging their progress.

e. Employ more sophisticated designs in assessing outcomes of conventional and non-traditional programs, with both students and faculty involved in decisions on the processes employed and the use of findings.

f. Infuse more imagination into PPPB systems, to break the stranglehold of accounting systems based largely on "input" time for both students and staff.

g. Devote more effort to informing students, alumni, parents, and citizens in general about what conventional and alternative programs accomplish, not just the fine facilities and staff they provide.

Higher education's success in the years ahead depends on developing students and staff who can grapple effectively with the future's large unknowns. The best hope for a renewed society clearly lies in renewed individuals: students and faculty members of large vision and competence who can play a critical role in this "making of tomorrow." The task of developing such persons should command our best efforts in the immediate future.

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Introduction and Recognition of Ralph Tyler

Fred F. Harcleroad

Ralph W. Tyler honors us tonight by joining us as we recognize his unique and pervasive effect on higher education, both in the United States and throughout the entire world. His service and the necessary world-wide travel are legendary. His accomplishments are legion and in a multitude of areas. Everyone in this room could recite a litany, in many cases personal, of Ralph Tyler's contributions in diverse and widespread fields.

There is, however, a symmetry to his broad band approach, some of which undoubtedly goes back to his earliest beginnings in Nebraska. The famous Tyler brothers come from strong pioneer stock, including a deep prairie religious background. A brief recap of his formal education seems necessary: A.B., Doane College, 1921; A.M., University of Nebraska, 1923; and Ph.D., University of Chicago, 1927. Since that time he has received dozens of honorary degrees in Letters, Science, and Philosophy. Perhaps the most unique of all is his baptism, unexpected, at Presbyterian Coe College, provided by a former Methodist minister who obviously believed in the Baptist system of total immersion. Ralph Tyler has hundreds of students and others whom he has helped to positions of eminence. The President of Coe College was one of these. The ceremony was proceeding ceremoniously in spite of a sudden and sharp rain storm. Honorees, guests of high rank, and college officials were seated on the stage which had an overhead skylight. The rain stopped and someone decided to open the skylight windows, forgetting that they were of the scoop or cup type. Opening them meant that the water collected during the rain storm came down on the stage, swamping everyone, including their, and our, guest of honor.

His honors, recognitions, and baptisms have come as a result of outstanding service over a span of 52 years. He started as a high school teacher in Pierre, South Dakota in 1921, supervised sciences at the University of Nebraska until 1927, and, having completed his doctorate, entered the formal academic procession. He began as an Associate Professor of Education at the University of North Carolina and moved to Ohio State University as the Great Depression descended on the United States. He shared an office with my major professor about the time that the Ohio State University budget was cut in half by the legislature. Surviving the drastic faculty cut, he was promoted and served as a professor and research associate for the Board of Educational Research until 1938. The University of Chicago lured him away for 15 years, from 1938 to 1953, where he served in a unique capacity as University Examiner in addition to his responsibilities as Professor and Chairman of the Department of Education. In 1948 he became Dean of the entire Division of Social Sciences, and, in 1953, as a result of his own personal vision, the Center for the Advanced Study of the Behavioral Sciences was established and he became its Director. Since 1967 he has been Director Emeritus of the Center and busier than ever. In the past two weeks he has chaired board meetings, served as consultant, made speeches, and attended meetings from San Antonio to Chicago to Fairbanks, Alaska, back to New Orleans, to Columbus, Ohio, and here tonight for this auspicious occasion.

Ralph Tyler has been the research leader or innovator in more important higher education developments in the United States in the past forty years than any other person. As Director of Evaluation in the Eight-Year Study his findings first broke the stranglehold on college admissions. He directed the Cooperative Study of General Education for the American Council

on Education. His interest in cooperative education has led him to a continuing responsibility in this area for the past 15 years. With a number of fellow leaders, he established the National Academy of Education. He served on the National Science Board following 1962. He is a Fellow of the Association for the Advancement of Science and a regular consultant on the most critical policy matters for the Office of the President of the United States.

In all of these responsibilities, students and ordinary people have come first, with emphasis on equal opportunity for everyone to enjoy the benefits of our society.

In 1967, as he became the most active emeritus educator in the United States, he was interviewed and emphasized the theme of ceaseless change and our need to respond positively to it. His concern for students was well illustrated by this statement:

> We have not begun to approach the potentials of student abilities. We must learn the basic wisdom of letting the individual learn, but at the same time we must learn how to demand successfully that he learn more. It is commonly recognized that most persons use only a very small portion of their intellectual capacity. So far we have only been tinkering with administrative arrangements in our efforts to achieve more effective learning. . . . We need faith in the ability of the individual student to learn. We have been badly misled by our misinterpretation of I.Q. scores. An I.Q. score measures what a person has presently learned about how to learn, but it says nothing about the limits of his ability to learn. Possibly we have frequently tried too hard to teach instead of providing freedom, encouragement, and materials for learning. We try too hard to reassure ourselves that we the teachers are working hard enough and doing the right thing. We focus too hard on ourselves, on teachers as the actors, as if they were the central figures in the play.

He further stated that:

> Our job is to be aware of reality, to understand reality and learn to manipulate reality in order to work effectively.

I am sure we all look forward with great anticipation to hearing his thoughts on change in current higher education, the perspective with which he views it, and the positive future that lies before all of us.

CAN A UNIVERSITY DETERMINE ITS FUTURE?

Ralph W. Tyler

American Universities Are Dynamic

During the past several months, I have been reviewing the history of American higher education and reflecting upon the probable future of the American university. As you all know, the past three hundred years have seen particular institutions become obsolete and disappear while others have not only remained but some have developed into stronger and more active universities than they were in their early years. We cannot predict the future with precision, but I believe that we can understand some of the factors influencing past developments and some of the conditions that must be dealt with in the future if the university is to maximize its contributions to society.

In the past American colleges and universities have changed in response to stimulation from two sources: social pressures growing out of societal changes and the suggestions for change that emerge from changes in the ideology of the academic profession. The development of the land-grant colleges is an excellent example of the response to changes in the larger society. Among the changes in the ideology of the American academic profession that have produced marked changes in the university is the emphasis placed on research. The societal pressures and the forces for change within the university are potent factors in making the American university a dynamic institution in which many particular ones do not become wholly rigid and die of obsolescence. This dynamic quality must be considered in looking to the future.

New Horizons Ahead

Because of the public's belief in the university's contributions to society's development it is being asked to extend its efforts far beyond its present capabilities. How universities will respond will strongly affect their futures. Since the end of World War II, for example, various new tasks have been proposed for American universities. Impressed with the success of the Manhattan Project in producing controllable atomic fission, many groups are urging universities to expand and intensify their research efforts in the hope that both industrial and social progress will be markedly accelerated. Recognizing the central importance of education and training in maintaining and developing a dynamic economic, political, and social order, universities are being asked to carry the burden of education and training of adults at all levels--remedial and refresher programs, retraining for new occupations as well as continuing education for management and the professions, and continuing liberal education. Realizing the inadequacy of the delivery systems and in some cases the conduct of many professional institutions, universities are being urged in some quarters to take responsibility for the reform, and even for the operation of these social institutions.

The outstanding success of the Cooperative Agriculture Extension Service of the land-grant colleges in bringing technical and scientific knowledge into the practice of commercial agriculture has led other fields such as education, the health services and public administration to ask for similar extension organizations and programs to be developed by the universities to serve these fields. In related proposals, universities are urged to develop demonstration programs to reduce juvenile delinquency, to improve law enforcement, to reform prisons and the treatment of those

incarcerated, to prevent or cure drug addition, and the like. In no time in history have universities been asked to expand their functions in so many directions.

At the same time, the universities are being pressed to improve their educational effectiveness, to enroll and to educate students from minority and ethnic groups who have heretofore been minimally represented in their student bodies. In the prevailing atmosphere, the American university could attempt to be the omnibus multi-versity that some have predicted it will become.

Limits to University Capabilities

The central core of the university's capability is its faculty. Although some faculty members may be renaissance men highly competent to perform any conceivable task, most of us are limited by our interests, education, and work practices to the conduct of some but by no means all of the tasks that have been proposed for the university of the future. Given sufficient funds and time it is possible to build a staff with other capabilities. The agricultural extension agents were developed into a profession with certain different capabilities from those of the resident faculty, but they were not simply college professors assigned to a different task.

The university structure has evolved to support the teaching and the research of individuals. It is not well adapted to producing processes and products demanded or requested by others and whose effectiveness is to be evaluated by others. The level at which the individual professor's objectives are consonant with those of other faculty members is highly general--the specific goals of his teaching are self-set and often are

not consciously recognized or stated. The evaluation of his teaching is largely limited to the feedback (satisfactions and disappointments) he gets from his interaction with students and not from some more objective appraisal. When he uses tests or examinations or assigns grades he usually considers it an appraisal of students and not of his own efforts.

The university structure is also supportive for the conduct of research by the individual professor who chooses his problem for study, determines the procedures to follow, sets his own time schedule and is largely dependent upon his own appraisal of his work until he reports it at professional meetings or in academic journals or both. Even then his work will normally not be reviewed and appraised by competent critics unless they judge it to be of more than average significance. This structure is helpful for supporting the scholar who has strong interests directed toward problems of fundamental importance, who is skillful in conducting scholarly inquiry and who seeks and values the criticism of his work by competent peers. It is not likely to aid those whose interests and skills do not furnish the necessary direction for scholarly efforts, nor does it provide the milieu for affective performance of applied research and development.

The university tenure and reward policies should be considered in assessing the capabilities of the university to undertake new tasks. They furnish little stimulation for improving teaching effectiveness or the quality of the research effort, even though these functions have long been accepted by most universities. They give no significant encouragement to the effective performance of other tasks that universities have been urged to assume. Without extrinsic rewards for performing a difficult job and without means for weeding out the ineffective, the university is limited in its capabilities.

The structure and functioning of university governance also need to be considered in assessing the capabilities of the university for certain kinds of tasks. Collegial responsibility and group decisions are not well adapted to guiding and controlling enterprises whose success is largely dependent upon satisfying the particular needs or pressures of outside groups, especially when the requirements are diverse and the populations served are very different from those with which faculty members are familiar.

In commenting on the limits of university capabilities to meet many of the new tasks proposed, I am not implying that new capabilities cannot be developed. Clearly the composition of the university staff can change, new structures can be built to support different activities, new tenure and reward policies can be devised and governance can change both in structure and in functioning. However, it is important to recognize any present limitations and be able to estimate what would be required in each case to overcome them. The construction of new capabilities necessitates a workable procedure, resources and time. Hence, there are real limitations on the extent to which new capabilities can be developed during any one time period.

Financial Support

Financial resources can be viewed both as one of the limits to university capabilities and as a positive factor in expanding or improving capabilities. The current outlook suggests that universities are facing a situation where new financial conceptions and new practices may be necessary.

During the 1960's public and private funds were provided in greatly increasing amounts to support the rapid expansion of higher education. However, as America became predominantly an urban society the demand for other public services--health, welfare, sanitation, safety and law enforcement, transportation, housing and recreation--greatly raised and sharply accelerated public expenditures at all levels, but particularly in the state and local units. Public resistance to increased taxation is rising, and it is likely that a point will be reached when this opposition to higher rates of taxation will effectively block additional support through public funds. Judging from the experience of Sweden, a socialist state, the average adult will strongly oppose higher tax rates when they appear to be taking nearly half of his income.

It seems a paradox that a vast majority of Americans want these services and can usually obtain them more economically through public support, yet they object to having the funds taken from them by local, state and national governments. However, it is understandable that people would prefer to be more directly involved in choosing how to spend their money. Even though the agency is a public one, people commonly do not feel it is the same as the individual or family spending the money for the things they want to get. It seems likely that more of these services will need to be delivered through means that permit individuals or families to "buy their own" if America is to reap the maximum benefit from the fact that only a fraction of the labor force is required to produce our material goods, thus permitting the majority of us to furnish non-material services. A proposal has been made to the California legislature that the state colleges and universities set tuition rates to cover all instructional costs. State support would then be limited to scholarship grants to students

whose families cannot afford to pay the tuition. Until devices like this are developed, public institutions can expect little increases in financial support.

Choosing A Future

Since universities are subjected to external forces and internal pressures and since they have limited capabilities, some may conclude that their futures will not be determined by choice but by circumstances outside their control. However, these forces and limitations usually set constraints but within them there is considerable latitude for choosing where to focus efforts. The problem is to utilize information, judgment and imagination in making choices rather than to be pressed into urgent decisions that have not benefited from study and involvement of persons whose interests and participation in long-range efforts are important. Hopefully, such study and deliberation will result in setting directions that maximize the utilization of university capabilities in contributing to social demands and opportunities.

For most universities, I believe that the capabilities that can be most productively maximized are those in the areas of education and research and that other services undertaken should be those in which education and/or research are centrally involved. Education, research and services centrally involving them represent large categories and they become more directive primarily in terms of the particular capabilities in these areas that are now possessed by a given university or can be strongly developed with resources attainable. Some of the issues of choice that need to be resolved in particular situations are suggested in the following comments.

Improving Undergraduate Education

I do not want to be included among those who make extreme attacks on the quality of American undergraduate education. As an investigator of the phenomena of learning among college students I have obtained a great deal of data on this subject, some of which strongly supports the value of the college milieu. It can be said that students who want very much to learn what universities are established to teach and who know how to find and use college resources are educating themselves to a high level. At the other extreme, those college students who do not see the relevance of college instructional programs to the furtherance of their own purposes and who have not learned how to explore and utilize the educational resources of the university are achieving very little in terms of the university's goals. The majority of American students are between these two extremes and each university has its own distribution of students along this continuum. It can be viewed as a self-service cafeteria from which students with good dietary habits, ample resources and know-how can obtain a good education, but for the nation at large those who do so are a minor fraction of the total enrolled. Among the others, several serious impediments to their learning are commonly found. For example, many are not clear as to what they are expected to learn and why. Many see no connection between their own interests and concerns and the activities of the classroom, laboratories and other assignments. A typical student spends less than half his time while in class attending to the subject of the course. Very few of those whose learning is not satisfactory get feedback about the particular respects in which their learning is inadequate.

Contemporary investigations also indicate that most, if not all, students could learn what universities seek to teach if use were made of the

knowledge about learning already available and of the imagination and energy of instructors. But for most universities, the effort required to examine the learning problems of undergraduate students and to furnish help for the faculty to develop new ways of teaching represent a major allocation of resources and a readjustment of priorities. Furthermore, universities face serious competition in rendering services to undergraduate students. Over the nation, junior and community colleges have been growing in importance. They now enroll more than 20 percent of all students in post-high school institutions, and at the rate these colleges are increasing in number as well as in enrollment, it is safe to predict that ten years from now 3,000,000 students will be enrolled in community and junior colleges, representing one-third of the total post-high school enrollment and approximately one-half of all first- and second-year students. Their importance is due to several factors. They are generally open door colleges, enrolling nearly all high school graduates or adults who apply. Because the students represent a very wide range of background and previous educatonal experience, the faculty generally recognizes the need for students to be helped to learn. Hence, more attention is given in these colleges to the curriculum, the relevance of courses, the appropriateness of the textbooks and other reading materials and the use of audio-visual aids.

These institutions are recognized as serving the community in which they exist so that students, parents, employers and other leading citizens are able to present their points of view and interests to which the college seeks to respond. They differ from the traditional four-year colleges also in permitting wide variations in attendance patterns, including night classes, alternation of work and study by terms or even years, and part-time

attendance while the student is employed in a full- or a part-time job or is largely occupied with home responsibilities. Because these colleges generally recognize that they have special responsibilities that differ from those assumed by the traditional four-year colleges, the faculty is recruited in large numbers from high school teachers and persons with experience in industry, agriculture and service occupations. Hence, they are more in tune with student and community expectations. Furthermore, the per capita cost of education is usually much lower in the junior and community colleges than in other institutions of higher education. It may very well be true that these new colleges are better able than the universities to educate students who need help in learning. I believe that this issue must be faced and a choice made by the university as to whether it will improve its undergraduate education. The decision to do so carries with it the obligation to develop the plan and furnish the resources.

Improving Professional Education

What has been said above about undergraduate education is also true about education for the professions except that professional students are generally interested in becoming competent professional people and in this way they have strong motivation for learning in those courses which they see as relevant to their professional goals.

The improvement of professional education requires consideration of particular conditions in each profession. The educational objectives of a professional program are commonly assumed to be the development on the part of the student of the knowledge, skills, and attitudes required for him to perform the professional tasks in which he will be engaged. But in times of rapid social change the demands on the profession are also changing, so that a student who is prepared to perform the tasks of the past is not

equipped to deal with some of the major ones he encounters on graduation. For example, most medical services in the past have been furnished to middle-class patients who suffered acute illnesses. Most of them were able to get well if the infection in their bodies were reduced or eliminated, or if an offending organ were removed.

Now a much larger proportion of potential patients are from working classes and many more suffer from chronic rather than acute diseases. Often their diet, their personal regimen, their anxieties over the financial problems created by their inability to work complicate their illness; many do not respond to the treatment. To help these patients secure and maintain health, the physician needs new procedures. Lawyers, too, find the practices appropriate for counseling clients who are business executives are not adequate to aid poor people who seek protection from unjust attacks upon their persons or property. Engineers trained to design specific mechanical or electrical systems for industry or commerce find new problems when asked to design devices to reduce health hazards and increase individual controls in homes and community centers for the poor.

Educational objectives are not only influenced by new tasks but also by the organizational structure (delivery system) in which the tasks are performed. The role of the physician differs when his services are delivered from an office to which the patient comes, when delivered in the supporting context of a hospital for acute diseases, when delivered in a community health center, or in some other structure. His role is not the same when his working team includes only a nurse and a record clerk as when he is part of a much larger and more complex organization. Similar differences in organizational structures are developing in other professions. Learning to operate in these different contexts is part of the education of the

professional, a part which has rarely been given explicit attention.

The central tasks of a profession are not performed by routine practice of accepted procedures. The problems the professional is expected to solve are complex and involve variations in conditions that make specific rules too rigid to be effective. The professional is presumed to operate on the basis of artistic adaptations of general principles relevant to the problem faced. In the case of medicine, principles developed by anatomists, physiologists, biochemists, and clinical researchers have served to guide the physician in his understanding of the medical problems encountered and in the treatment he devises. With the development of new roles for the physician, there is also need to review all the possibly relevant fields of scholarship to identify concepts and principles from whatever disciplines they may have been formulated that can help the physician understand his problems more fully and guide his designing of treatments. The so-called basic sciences of medicine may not be the same as those in the past when problems and roles are changing. The same need for reviewing basic principles is found in the other professions. These reviews are necessary in identifying the knowledge resources on which to build education for a profession.

In improving professional education consideration needs not only to be given to what is taught but also when. Part of the reason for assigning a long period of time to the initial period of professional education was the desire to see that the student was fully prepared before he embarked on his career. This effort utilizes a considerable amount of time in what the psychologists call "overlearning," that is, carrying the learning and practice exercises to the point where very little forgetting or other learning losses are likely to occur. A more efficient use of time carries the learner through a phase at a time and as soon as he demonstrates initial

competence in the performance of that phase, he is employed in work where this can be practiced as a regular part of his professional activity until he is a master of what he has learned. Then he engages in the next phase of his professional education. By distributing the learning periods throughout his professional life and capitalizing on special learning environments furnished both by the work situation and the environment of the school, professional education can be both more effective and more efficient. Furthermore, a larger part of the student's learning time is also contributing needed services to the profession.

The re-examination of the question of when a student should learn to be a professional leads to a review of what is becoming known about student learning in a professional school, knowledge that has important potential for increasing the efficiency of education. A typical layman's view of an ideal learning situation for a university student is that of Mark Hopkins on one end of a log and a student on the other. This notion is not well supported by research studies of learning in professional schools. Hughes, Becker, and Greer's study of a medical school called Boys in White gave quite a different picture. The faculty members appeared to have little knowledge of the total demands made on students in their various lesson assignments. The students, faced by what seemed to them to be an impossibly heavy load, decided what was important to do, and what was not, how much to do, and how much time to spend on their various courses. The student peer group became the source of decisions about educational objectives and the amount of time to be used in learning efforts. The lack of coordinated faculty planning of the actual learning experiences that students will find helpful in achieving objectives makes the typical professional program a collection of unrelated and often ineffective assignments. Most professional

school faculties have not utilized what is known about the general nature of human learning in the planning and conduct of the educational program.

Professional education can be improved markedly by the thoughtful and determined use of available knowledge, but in some respects it demands even more time and resources than is required to improve undergraduate education. Professional schools are encountering new problems, they are feeling conflicting pressures, and they find their resources all too limited to do the things they want to do. Yet the demand for educating professionals is great and the social contribution the university makes through professional education is substantial and it is not in serious competition with other institutions. This opportunity deserves very serious consideration.

Research Responsibilities

Mention was made earlier of the high priority currently given to research in American academic ideology. The time has come for a more objective and ethical assessment of academic research productivity. The folklore that every teacher should also be a researcher may have had a good influence when it was promulgated at the end of World War I in developing research interests and attitudes favorable to research in an otherwise pragmatic society. But as a means of training people for research or furnishing an efficient basis for obtaining new knowledge it has been grossly inefficient. Most persons, when they receive the degree of Ph.D. require experience on the job to become effective researchers. This is not surprising. In medicine, law, engineering, and business administration, for example, university education provides only one component of preparation for the profession. Experience on the job, preferably with skilled guidance, is necessary for the development of a competent professional. Several independent estimates of the output of new knowledge attained by government

support of research projects in universities indicates that, at most, no more than 20 percent of the projects have provided any new knowledge, and some estimates run as low as 5 percent. As might be expected, new knowledge is obtained most commonly by the work of well-trained researchers, whose deep interest in investigating problems is also well supported by continuing contact with other productive scholars. Most of this new knowledge has come from work carried on in a very few institutions. Probably not more than two percent of all faculty members in American universities are producing significant new knowledge. The notion that every professor is a competent research scholar is a fiction and an effort to bring this ideal to reality seems destined to fail.

There is another scholarly ideal that has largely been lacking in American academic circles since 1920, that every professor is one who understands the most significant knowledge in his field and can interpret it for others. This conception of the university professor was generally recognized in earlier years and is today fully as valuable to the development of an informed and intelligent society as it ever was. Many thoughtful people believe it to be more important than research. In any event, this is a good time for university choice--to what extent, in what fields, and under what conditions to focus resources on really productive research. This decision may imply developing new or additional capabilities and withdrawing support from less productive or less promising efforts.

Providing Other Services

Most universities today are reacting to requests that they develop and furnish a wide array of services to various groups in society. Many of these demands are related to laudable purposes, and their proposers may attack the university for its conservatism, or lack of social values if the

requests are not met. However, the university cannot expect to be the sole social institution in the community. Too wide a dispersal of attention and resources has resulted in ineffectiveness more often than too narrow a focus. The development of new institutions designed specifically to meet new or newly recognized needs is likely to serve new needs as well or better than through the use of existing institutions unless the services required are closely linked to the present successful efforts. These considerations lead me to suggest that university services other than in education and research should be accepted or developed when they can be closely related to activities in education and knowledge acquisition and interpretation. Examples of such services that quickly come to mind are continuing education in the professional fields in which the university is now successfully engaged, consulting services relating to critical problems of the community, aid in the development and personnel training for new institutions, and in the development of local, state and national leaders in social and political affairs. This is an illustrative not an exhaustive list. It is intended to show that new services can be provided that fall within the present capabilities and require less time and energy to develop than services that are not based on the present interest and competence of the staff.

Concluding Comment

The basic position of this paper recognizes the fundamental role of the university in modern society. It assumes that although society will continue to change the core competence of the university in acquiring and interpreting knowledge and in educating people will continue to be demanded. However, the university will need to reshape and redirect many of its

efforts in order to serve society most effectively. It also assumes that increases in financial resources will be modest. The problem then becomes one of choosing major directions and allocating resources there so as to support the planning and development of new and/or more effective services.

RESEARCH-BASED DECISION MAKING IN HIGHER EDUCATION: POSSIBILITY OR PIPE DREAM?*

Alexander W. Astin

The politics of grantsmanship in educational research have undergone an interesting change during recent years. Until just a few years ago it was fashionable for educational researchers to disavow any direct concern with the practical implications of their efforts. Indeed, those few privileged colleagues who were called upon to review grant proposals were generally inclined to consider it a sign of bad taste and possibly even bad breeding if the proposal writer admitted openly that he was engaged in applied research. Since the funding agencies typically assigned the major decision-making power to this elite community of outside reviewers, any grantsman worthy of the name went to considerable trouble to insure that his proposal was heavily loaded with theories, models, hypotheses, and similar esoteria.

As we all know, however, educational research today is an entirely new ballgame. Funds are more scarce, and both public and private funding agencies are taking a much more active interest in the applied aspects of research proposals and, at the same time, removing much of the power from the hands of outside reviewers. As a matter of fact, the situation seems to have reversed itself completely to the point where theoretical or basic research gets virtually no support. We are all familiar by now with the new jargon: policy research, accountability, educational evaluation, action research, performance contracting, and the like. This reversal of field by the funding sources has created a whole new breed of grantsmen who call themselves "policy researchers."

*Remarks based on a study supported in part by Grant GI-34394 from the RANN program of the National Science Foundation.

Whether all of this emphasis on applied research is really going to have any impact on decision-making in education is difficult to judge. I must admit that some of the early work of the so-called policy researchers looks depressingly familiar. One apparent difference from the old days is that investigators now seem much more willing to go far beyond their data in identifying, as they say, the "policy implications" of their findings. Whether or not this new breed of educational researchers will really have any significant impact on educational policy is, of course, still a moot question.

When we initiated the Cooperative Institutional Research Program at the Council eight years ago, policy research was not part of the jargon of the trade. As a matter of fact, we had some difficulty selling the program to funding agencies because what we were proposing to engage in was obviously applied research. One of the principal objectives of the program, for example, was to influence the decision-making process in higher education by producing information on how alternative educational practices affect student development. The program was thus designed around a relatively simple conceptualization of the educational decision-making process. In brief, we saw educational decisions as involving the manipulation of means to achieve certain educational ends. At the institutional level, these means might include fattening the budget, instituting certain required curricula, modifying procedures for faculty recruitment or in-service training, manipulation of the physical environment, and so forth. At the multi-institutional or system level, the means to be manipulated included such things as the relative size of institutions, comparative curricular emphases of different institutions, location of new institutions, and the allocation of budgetary resources among institutions. The ultimate end of such education decisions

according to our scheme, was to optimize the development of the student. By "development" I am speaking broadly here to include the student's knowledge, ability to think critically, vocational success, happiness, and so forth.

Our research program was thus designed to include information on the characteristics both of institutions and of programs within institutions, as well as longitudinal information on the student's development. By observing how the student develops in different types of institutions and programs, we were seeking to gain a better understanding of the causal connections between educational ends and the alternative means that might be employed to achieve these ends.

Until recently we have been able to defer the question of whether or not our research really could have any impact on the decision-making process, since our design was of necessity longitudinal, and longitudinal data take time to collect and analyze. But since the longitudinal data are now beginning to pile up, the day of reckoning is at hand.

What I would like to do today is to present some recent longitudinal results from our research program to illustrate possible ways in which they might be used in the educational decision-making process. Time will permit me to present only a limited segment of the many findings from these analyses, but hopefully these examples will illustrate some of the larger possibilities for the use of our data in the policy and planning process.

The data that I will be presenting are taken from a four-year longitudinal study of freshmen who entered college in the fall of 1966 and were followed up four years later in the summer of 1970. The 217 participating institutions represent a stratified national sample that includes two-year colleges, four-year colleges, and universities. This relatively large

sample thus permitted us to study the impact of various structural characteristics such as institutional size, selectivity, level of degree offered, and type of control, as well as within-institution attributes such as the type of financial aid given the student, living arrangements (for example, residency versus commuting), parietal rules, honors programs, and the like.

The educational end or outcome which will be the primary focus of my presentation today is our old friend, the dropout phenomenon. Although we have employed several alternative definitions of the term "dropout" in our analyses, for the purposes of today's discussion I have defined the dropout as anyone who was not able to complete the baccalaureate degree within four years after matriculating. Students who had obtained the degree at the time of the followup were thus classified as nondropouts, whereas all other students were classified as dropouts. A nondropout did not necessarily have to complete the degree at the first institution; thus, as long as the student had obtained the degree somewhere by the time of the followup, he or she was classified as a nondropout. As with any measure of dropout status, this particular one contains certain weaknesses. In particular, it should be noted that other more recent data suggest that at least one-third of the dropouts will eventually complete the bachelor's degree, although their time to completion will, of course, be longer than for those who are currently classified as nondropouts. We should also keep in mind that there can never be a wholly satisfactory definition of the term dropout until all students either obtain their degrees or die without obtaining a degree; any former student can, in theory, go back to

complete his degree.* It is also worth pointing out that a vast majority of students, including those entering two-year colleges, initially intended as freshmen to obtain the bachelor's degree in four years. Those who were classified as dropouts by the current definition can thus be regarded, at best, as having delayed completing their degrees, and at worst, as having failed to realize their initial aspirations.

To facilitate the presentation of findings I shall make the simplifying assumption that the educational decision-maker to whom we might address our research findings would be interested in minimizing the proportion of students who fail to complete college. In other words, completing college is one important end which the decision-maker seeks to maximize by manipulating the various means at his disposal.

In considering the implications of our findings for such decision-making, it is useful to think about two distinct classes of factors that can be manipulated to influence the proportions of students who drop out: characteristics of the students when they first enter college (which we call student input characteristics), and the various environmental experiences (means) that confront the students once they enter. Student input factors can, of course, be manipulated by recruitment and admissions policies, whereas environmental factors can be manipulated in a variety of ways.

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*It has recently become fashionable to regard dropping out in a positive rather than a negative sense; we all know of instances where particular students were encouraged to take some time off to reconsider their plans and eventually returned to complete their degree work successfully. Our data suggest, however, that these students represent a very small minority of dropouts, and that most of them leave college not because they have something better to do but because of dissatisfaction with the college environment or because of external factors in their work or home life that prevent them from continuing. This conclusion is supported by data which show, among other things, that the majority of dropouts still want to go back to college someday to complete their degree work.

Effects of Student Input Characteristics

Perhaps the best way to illustrate the importance of these various input and environmental factors is to consider first the typical college student. By "typical" I am speaking in the normative sense of a hypothetical student who possesses the most frequently-occurring input characteristics and who encounters the most frequently-occurring environmental experiences.

The academic background of this student includes graduation from a public high school with a cumulative grade point average of approximately B-, and verbal and mathematical scores on the College Entrance Examination Board tests of about 500 each (the equivalent ACT Composite score would be about 23). With respect to family background, our typical student is a white male, is from a Christian background, and has a mother who completed high school but did not attend college. At the time of entrance to college, he intends to take at least some graduate work and reports that there is "very little chance" of his getting married while in college.

If we turn now to the most likely environmental experiences of our typical student, we find him enrolling at a coeducational public university of moderate selectivity. He lives in a dormitory during the first undergraduate year and receives the bulk of his financial support from parents. True to the earlier prediction, our student does not get married during the undergraduate years.

Our data show that a student who follows this pattern has about a 50-50 chance of completing the baccalaureate degree in four years. These odds, however, can fluctuate substantially, either up or down, if we vary some of the student input or environmental factors just described. The methodology that we used, I might add, permits us to examine the <u>independent</u>

effects of various input and environmental factors when they are considered together.*

First let us examine the effects of variations in the student's academic background. If you turn to Figure 1, you will see that we have set up a scale which indicates the student's chances of completing a baccalaureate degree within four years after entering college. This scale is represented by the horizontal line running from left to right across the chart. Our "typical" student just described is represented by the vertical dotted line at the 50 percent mark. The first horizontal bar on the chart shows how the chances of obtaining a bachelor's degree in four years differ as a function of the student's average high school grades. Notice that the odds go up to almost 70 percent among students who have A averages, and go down to nearly 25 percent if the student has a D average in high school. (These D students are, to be sure, in a small minority, but they nevertheless can be found in many different types of institutions.) The second horizontal bar down on the chart shows how the student's academic ability, as measured by standardized tests, affects his chances of obtaining the baccalaureate. Notice that while test scores do make a difference, the effects are only about half as strong as those of the high school grades. Thus, in attempting to judge the importance of these two factors, decision-makers should pay considerably more attention to academic performance in high school than to the student's scores on tests of academic ability. The third background factor shown on the chart is a graduate from a private

*These results are based on regression coefficients which were obtained by pooling all of the input and environmental variables in a single regression solution. The students (N=5,200) represented every fifth subject from a file of about 26,000 students who had completed both a freshman questionnaire in 1966 and a followup questionnaire mailed to their homes in the late summer of 1970. For more details of the sampling and methodology, see Astin (1972).

high school. Remember that our typical student attended a public high school. However, if he graduates instead from a private high school, his chances of completing the baccalaureate within four years are increased by about 8 percent. The most likely explanation of this finding is that the standards of grading at private high schools are somewhat more stringent than those of public high schools. The private school graduate's high school grades are therefore somewhat of an underestimate of his chances of completing the degree. The fourth and final bar on the chart shows the possible cumulative effects of the three factors relating to the student's academic background. Thus, for the student who graduated from a public high school with poor grades and low test scores, the odds of completing the baccalaureate in four years are very low: only about one in six. Conversely, for the private high school student who has an A average and very high scores on tests of academic ability, the odds are substantially better: nearly five in six.

Our second category of student input characteristics is the student's family background. The impact of these attributes on obtaining the baccalaureate in four years is shown in Figure 2. Again let us consider the vertical dotted line at 50 percent as representing the typical student's chances. It will be recalled that our typical student comes from a family in which the mother has completed high school but has not attended college. Notice that a student's chances of obtaining the baccalaureate will be improved by about 10 percent if his mother has a graduate degree, and reduced by a little better than 5 percent if the mother never got beyond grammar school. The second bar on the chart indicates that the Jewish student's chances are slightly better than those of the non-Jewish student. The third bar indicates that the chances of getting a degree will be

substantially poorer if the student is Mexican-American. The final bar on the chart, as with the previous chart, shows the possible cumulative effects of all three family background characteristics on the student's chances of obtaining the baccalaureate. Again, I want to emphasize that these bars represent estimates of the independent effects of each factor or set of factors.

Because of the great current interest in racial and ethnic characteristics of students, it might be useful here to comment briefly on the possible significance of these findings. First, we should keep in mind that being black, American Indian, or Oriental, did not as such seem to make any difference one way or the other as far as obtaining the baccalaureate in four years was concerned. In other words, students from these minority groups performed pretty much like white students once we had taken into account the other academic background and environmental factors. Blacks, for example, have somewhat lower completion rates than whites, but these differences disappear once we take into account differences in academic background. In the case of Mexican-Americans, however, their chances of completing college in four years were substantially lower than the chances of other students with comparable academic backgrounds. Possibly we are seeing here the effects of language handicaps. It seems likely, for example, that Spanish-speaking students might encounter special academic difficulties not encountered by students whose native language is English, or simply become discouraged by the type of curriculum and other educational experiences that they encounter. In this connection, it is pertinent to note that we recently produced similar findings with respect to Puerto Rican students in a study of open admissions at the City University of New York (Rossman, Astin, Astin, and El-Khawas, 1972). (The study I am reporting

today did not have a separate item to identify Puerto Ricans.) Whatever the explanation may be, it seems clear that Spanish-speaking students merit special consideration both before and after they matriculate.

One final comment concerning family background characteristics is in order. In spite of the considerable significance that we usually attach to the income of the student's parents (the financial aid provisions of the recent Higher Education Amendments being one illustration of this concern), our multiple regression analyses fail to reveal any direct effects of the parents' income on the student's chances of obtaining the baccalaureate in four years. We did find, however, that the manner of financing the undergraduate years does make a difference; I shall discuss these findings in a few moments when we turn to environmental characteristics.

Figure 3 shows the effects of our third and last category of student input characteristics: plans and aspirations. The first horizontal bar on the chart shows the effects of the student's stated marital plans at the time of matriculation. Not surprisingly, students who report that there are "very good chances" of their marrying while in college have somewhat lowered odds of actually completing college in four years. In this connection it should be noted that this item operates only for women (a matter which I shall return to in a few moments). Ideally I might have presented you with separate charts for men and women, but I am afraid it would have made the presentation too unwieldy. The next bar on the chart shows the effects of the student's stated degree plans at the time of matriculation. Again, it is not surprising that students who express little or no interest in obtaining a degree when they enter college have relatively poor chances of getting one in four years. What is perhaps surprising is that this particular item did not show an even stronger relationship to getting the

degree. A large part of the weight that might otherwise have been associated with this item is, of course, carried by the academic background factors. Thus, if we had left the academic background factors out of our multiple regression analysis, the bar for degree plans would have been somewhat longer. The third item in the chart is perhaps an artifact of our dropout measure. Since many engineering programs take five years to complete, it is to be expected that students who enter college planning to major in engineering have somewhat less chance of completing a baccalaureate in four years than do students who plan to major in other fields. This interpretation is supported by some of our other analyses (Astin, 1972) in which we have shown that majoring in engineering disappears as a predictor of dropping out when those students who have no degree but who are still enrolled after four years are not counted as dropouts.

Our fourth measure of plans and aspirations--majoring in fine arts--also reduces the student's chances of completing the baccalaureate in four years. A possible explanation here is that, for those students whose primary interest is in one of the fine or performing arts, obtaining the degree has somewhat less relevance to long-range career plans than is the case with undergraduates who are majoring in other fields.

The final item relating to future plans and aspirations is the student's intention to become a secondary school teacher. Why this career choice should be a positive factor in college persistence is not immediately clear, although it may be that such students are more conscientious and more determined to complete their undergraduate training than are students with other types of career plans. Whatever the explanation, it is clear that this particular item does not carry very much weight in our predictions. The last horizontal bar in the chart shows the possible cumulative effects

of all five items concerning the student's plans and aspirations. Notice that the student's chances of finishing in four years are reduced by about one-half--to only 25 percent--if degree aspirations are low, if marriage plans are strong, and if the student intends to major either in engineering or in fine arts. On the other hand, the student's chances are increased by about 15 percent if he plans to become a secondary school teacher, intends to obtain a doctoral-level degree, and has no plans for marriage.

Effects of Environmental Factors

Now let us turn to the environmental experiences of the students once they enter college. I shall first deal with experiences within the college which ordinarily apply to only some of the students at the college, and then conclude with an analysis of how the type of college itself affects the student's chances of completion. Our first category of environmental experiences concerns how the student finances his or her undergraduate education. These results are shown in the next figure (Figure 4). The first bar in the figure indicates that the student's chances of completion are increased by approximately 15 percent if he receives support in the form of a scholarship or grant. You will recall that parents provide at least 41 percent of the support for the "typical" student. The second bar indicates, however, that if the student receives less than this amount of support from parents, the chances of completion are reduced by about 10 percent, but if the student does not receive substantial support from parents and is dependent on the spouse for significant support, the chances are reduced substantially.

These findings on the effects of various types of financial support have obvious implications both for institutional as well as for state and federal policy regarding the use of financial aid. Our data show clearly that there are substantial benefits, in terms of increased college completion rates, to be derived from scholarship or grant support. Other forms of support (loans and work-study programs, for example) showed no particular effects one way or the other in our analyses. The implications of these data for decision-making are clear: a greater concentration of limited resources of financial aid in scholarship or grant programs might produce a substantial increase in the number of students who are able to complete college. Indeed, for those who like to view higher education financing in terms of "cost-benefits" analysis, a little bit more information on the costs of the scholarships received by these students would make it possible to estimate how many dropouts could be salvaged for every X dollar of scholarship money.

The results for our second category of environmental experiences--which I have labeled "college activities"--are shown in Figure 5. You will recall that our typical student does not get married and lives in a dormitory during the freshman year. The first three bars in Figure 5 show clearly that the student's chances of completing the degree in four years are substantially reduced by marriage, by having children, and by living somewhere other than in a dormitory (usually with parents). It is important to point out once more that there are <u>independent</u> effects; that is, students who get married but who do not have children still have somewhat less chance of completing the degree than do unmarried students, and students who neither get married nor have children but who live at home or in a private apartment have substantially less chance of completing the degree than do

dormitory residents. It is clear, however, that having children carries much more weight than simply getting married. The next-to-last bar in the chart shows the positive effects of student participation in honors programs. This finding suggests that increasing the amount of student participation in such programs might be one way of reducing the dropout rate of a college. Certainly these findings ought to be a stimulus for colleges to consider expanding the size and number of such programs, at least on an experimental basis.

The last bar in Figure 5 shows the possible cumulative effects of these four college experiences. Thus, if a student does not live in a college dormitory during the freshman year, get married, and has children, the chances of completing a degree in four years are reduced by more than half. While the findings with respect to living in a dormitory apply equally to men and women, again we found that the effects of marriage and having children occur only for women students. This finding, together with the finding concerning the negative effects on women of having to rely on the husband for financial support, seem to reflect the persistence of our traditional sex roles and sex stereotypes, in the sense that the burden of getting married and having children, in terms of interruption of educational and career progress, is shouldered virtually entirely by the woman.

Another interesting aspect of these findings concerns the effects of dormitory living. As most of you know, educational planners and legislators have recently questioned the need for maintaining residential facilities in colleges and universities. The arguments against such facilities, it would seem, are primarily economic rather than educational. Our data seem to suggest that abandoning such facilities and dropping residential requirements for freshmen will ultimately increase the dropout rates of

institutions. It might be an interesting exercise, again in the spirit of cost-benefit analysis, to calculate the relative costs of maintaining residential facilities in terms of the benefits that would be derived by increased completion rates. Perhaps this would be cheaper than, say, increasing scholarship aid.

Our final category of environmental characteristics is the type of college attended. These results are shown in Figure 6. You will recall that our typical student attended a public university. The first bar on Figure 6 indicates that the student's chances of completing the degree within four years will be somewhat reduced by attending a junior college. The odds of completion will be somewhat increased, however, if the student instead attends a privately controlled, noncoeducational institution. The other two college attributes shown in Figure 6 are the size of the institution, which has a small positive impact. Thus, the student's chances of completing college will be slightly increased by attendance at a small, highly selective institution.

It is tempting to conclude from the data shown in Figure 6 that the cumulative effects of type of college attended are relatively small in comparison with other environmental and student background characteristics. We should keep in mind, however, that these are averages for general categories of institutions and that certain institutions in our sample of 217 showed very pronounced effects on the student's chances of completing college. Several institutions, for example, showed rates of degree attainment that were fully 25 percent higher than what would have been expected on the basis of the characteristics of the students who entered. Most of these institutions were either small, private liberal arts colleges or fairly selective private universities. Other institutions, on the other

hand, showed rates of degree attainment that were fully 25 percent below the rates that would be expected from the characteristics of their entering students. Most of these institutions were public or private junior and community colleges.

Why the two-year institutions should decrease the student's chances of obtaining the baccalaureate degree in four years is subject to a variety of possible interpretations. For one thing, the mere logistics of transferring may present an obstacle which discourages some students from continuing beyond the first two years. One has to obtain application forms, fill them out, and then be accepted by the baccalaureate institution. At the same time, the presence of a large number of terminal-vocational students at the two-year institution may sometimes create an atmosphere which is not supportive of plans to obtain the baccalaureate. Several studies currently underway at the American Council on Education are designed to get a better understanding of the possible reasons for this finding with the two-year colleges.

Our findings with respect to large, public coeducational institutions--which reduce somewhat the student's chances of completing college in four years--are also subject to several possible interpretations. For women, going to a coeducational college increases their chances of getting married. Also, earlier research (Astin and Panos, 1968) has suggested that this type of institution typically has an environment which alienates the student and makes it difficult for the student to establish and maintain a close affinity for the institution and its mission. Small, selective private institutions, on the other hand, are more likely to have an environment which promotes interaction among students and faculty and which is perceived by the student as basically supportive (Astin, 1968).

My last figure (Figure 7) summarizes the possible cumulative contributions of the six general categories of student input and environmental characteristics. In general it would appear that student input characteristics (the first three horizontal bars in the chart) are a potentially greater source of influence than environmental characteristics (the last three bars). This generalization applies especially to academic background characteristics--not a surprising finding considering that most higher education institutions explicitly favor and reward students who are well-prepared academically. This is not to ignore the fact, of course, that other aspects of the student's family background and future plans can be potentially important sources of influence. Among the various sources of environmental influence, college activities--particularly getting married or living in a dormitory--represent perhaps the most potent sources of influence. The type of college attended is apparently a somewhat more important potential source of influence than are finances. Although source of finances is a relatively minor influence, this does represent one area where decision alternatives are possible. The same would be true to some extent of college activities.

Implications for Decision Making

As I have already suggested, there are two mechanisms that the decision maker who wishes to reduce dropout rates can utilize to apply the findings of this research. The first and most obvious approach is through the recruitment and admissions process. Institutional administrators who wish to minimize their dropout rates through this mechanism could simply recruit more students with superior grades in high school, high scores on standardized tests, high degree aspirations, and highly educated parents. Students who

did not demonstrate such attributes could be discouraged from applying and those who did apply could be rejected.

The difficulty with such an approach is, of course, obvious: adherence to such traditional recruitment and admissions criteria would run counter to the current spirit of expanding educational opportunities and providing greater access to higher education for disadvantaged students. Furthermore, some public systems of institutions are already committed to the admission of all or most applicants, regardless of background factors.

A more fundamental concern with manipulating the decision process in this manner is that it has no basic <u>educational</u> purpose. Merely screening out the high risk students would not necessarily result in greater educational benefits to the society. This is not to say that our data on student input characteristics are of no value in institutional decision making and planning. One possible application, for example, would be to apply the formulas that we derived for predicting the student's chances of dropping out based on freshman input data. Given a particular group of entering students, applying these formulas makes it possible to estimate fairly accurately the proportion of students who will be able to complete degree requirements within four years. Furthermore, the formulas also allow one to identify those students who are very high dropout risks; such information might prove valuable in guidance and counseling with newly admitted students.

The results concerning environmental factors offer much greater potential, I think, for enhancing the decision-making process in a meaningful and productive manner. For example, it seems clear that institutions that wish to reduce their dropout rates have at least three available alternatives: to increase the amount of scholarship aid (as opposed to other forms of financial aid) available to students, to increase the extent of student

participation in honors programs, or to encourage more students to live on campus during the freshman year. Decision-makers who are concerned with whole systems of institutions have still other alternatives: reduce the number of two-year institutions or large institutions, or at least attempt to develop programs which will compensate for the usual negative effects of two-year colleges and large institutions.

To carry this kind of reasoning a bit further, one could use these results to develop quantitative estimates of benefits to be gained, in terms of reduced dropout rates, from various alternative plans. Table 1 shows the likely benefits to be derived from five decision alternatives. From the perspective of the student decision maker, the greatest benefits are associated with the decision to attend a four-year rather than a two-year college. However, for administrators who are already responsible for a particular type of institution, the most likely alternatives involve honors programs, scholarship aid, and dormitory living. The results with dormitory living are of particular interest, given the current trend in higher education toward phasing out of residential facilities and elimination of residential requirements for freshmen.

To explore the question of dormitory living in somewhat greater detail, let us examine the effects of dormitory living on completion rates separately for two-year colleges, four-year colleges, and universities (Table 2). First of all, it should be noted that these data reflect the differential effects of the three types of institutions: the student's chances of obtaining the baccalaureate are substantially lower at a two-year college than at a four-year college or university. The effects of dormitory living, however, are greatest in four-year colleges, and apparently slightly negative in the two-year colleges. Why the positive effects of dormitory living

should not occur in the two-year colleges is not immediately clear, although it seems likely that living on campus at a two-year college would not necessarily ease the problem of transfer, which, as we have already suggested, may represent a major obstacle to the two-year college student who wishes to obtain the baccalaureate.

In order to present these results more explicitly in a decision-making context, we have recast the data from Table 2 in a different form (Table 3). This table shows the various decision alternatives (living arrangements and type of college), given various constraints. The concept of "constraints" in decision-making is of critical importance, since the alternatives available to a particular decision-maker are very often limited by factors beyond his control. An administrator in a university, for example, is really not interested in how more dormitories might reduce his dropout rate if he has no means to construct such facilities. By the same token, the student who is committed to living at home with his parents is not particularly interested in the likely consequences of living in a dormitory or private room. The data in Table 3 thus show the percentage gain or loss in rates of completing the degree in four years for various decision alternatives under various constraints. Notice that dormitory living, in contrast to living at home, has its greatest impact for students attending universities and four-year colleges, and a negative impact for students in two-year colleges. By the same token, the advantages of attending a four-year college versus a two-year college are greatest for students who live away from home (either in dormitories or private rooms). The gains here are quite substantial: a 25 percent increase in chances of completion for students living in dormitories and a 20 percent increase for students who live in a private room.

Let us assume that our data prompt a particular administrator to institute a program of required residency for freshman students. This decision might involve, for example, renovating dormitory facilities or even constructing new facilities. The costs involved in such decisions could, of course, be evaluated in terms of the number of dropouts who would presumably be salvaged. Data of this kind make it possible to estimate not only probable reductions in dropouts, but also the likely side effects of the decision to introduce a residency requirement. Table 4 shows some of these side effects on other student outcomes. The various outcomes are presented in five broad categories: educational progress, educational plans and interests, behaviors, values and attitudes, and ratings of the college.

In addition to reducing the proportion of students who drop out, requiring students to live on campus would increase the percentage who plan to go on to graduate study and would also tend to raise grade point averages. (The latter effect, of course, could be defeated if the faculty persisted in grading strictly on the "curve.") Required residency would also tend to increase the number of students who would end up majoring in education or social science and to decrease the number who end up majoring in business or engineering. Such outcomes might have important implications, for example, for curriculum planning and faculty recruitment. Although the results in Table 4 are not presented in quantitative form, our data bank would permit a decision-maker to estimate fairly accurately the actual number of students whose choices would be affected by the decision.

Requiring freshmen to live on campus would also tend to increase the rate of student drinking, smoking, and dating. There would also be an increase in the proportion of students who oversleep and miss classes--

possibly a dubious benefit as far as faculty are concerned. At the same time, there would be a decrease in the attendance at Sunday school and church, gambling, and driving cars. (The latter effect is probably an artifact of the need for most commuter students to drive cars.)

Living in dormitories during the freshman year also appears to increase the students' feelings of popularity, self-confidence, and public speaking ability. In the political realm, there is a decrease in conservatism and an increase in liberalism that results from living in a dormitory during this first year.

The final category of side effects concerns how the student rates his college. There seems to be little question that these benefits of dormitory living are positive. Not only is overall student satisfaction likely to be higher, but there will be more personal contact between students and faculty, more interaction among students, and more opportunities to receive advice and guidance and to discuss work with professors.

Discussion

Given the breadth of data already available through our research program, the exercise I have just gone through could be repeated using many student outcomes other than persistence, and with many decision alternatives other than residency status. The possibilities here are interesting to speculate about. What would happen, for example, if we were to design a highly sophisticated information retrieval system in which to store all of our findings? Decision-makers who wished to use the system could approach it from either of two angles. Those who wished to maximize some sort of outcome (like completion rates) could present their objectives to the system, together with any relevant information about constraints. The constraints could include available resources, legal limitations, types

of students involved, etc. The system could then indicate which of the possible alternatives, or which combination of alternatives, would maximize the desired outcome. For each alternative, the system could also display the probable side effects in terms of other outcomes. To make it a bit more complicated, the system could be designed so that the decision-maker could specify several desired outcomes at once, with relative weights to be assigned to each.

The second type of application would be to present the system with a decision problem which has already been defined (for example, what kind of admissions policies should be established for different types of institutions within a public system). The system could then display the likely consequences of the several alternative admissions plans in terms of various student outcomes.

Separate systems could also be designed for use by different types of decision-makers: college-bound high school students and their parents and counselors, institutional administrators, or planners and policy-makers at the system or national levels.

I want to emphasize that the data permit a large number of other refinements. For example, it is possible to estimate the likely consequences of certain decision alternatives separately for students of differing ability, sex, race, income, or social background. While such a system does not as yet exist, we now have both the data and the technical capability to develop it. Of course, whether decision-makers could be encouraged to make use of it is another matter, to which I shall return in a minute.

Even without such "Buck Rogers" aids for decision-making, these findings would appear to have important implications for education policy, particularly

as it might apply to the problem of college attrition. Let us speculate for a moment on the consequences, in terms of likely changes in national dropout rates, of some of the major current trends in higher education. To begin with, there seems to be little question that the continuing expansion of educational opportunities, as represented by trends such as open admissions and special programs for disadvantaged students, will result in much larger numbers of "dropout-prone" students entering the higher educational system. Their test scores and high school grades are likely to be relatively low, they are likely to come mostly from public secondary schools, and the educational level of their parents will tend to be lower than that of students admitted in earlier times. Furthermore, there seems to be little question that the ability of their parents to provide major support for college expenses will be less than in the case with parents of more traditional students. Consequently, unless special accommodations for these "new" students (Cross, 1971) are made--whether these accommodations be in the form of increased financial aid or special counseling and guidance programs--there seems to be little question that the national dropout rates will increase simply as the result of these changes in the entering student population.

As if these problems were not enough, the American system of higher education is undergoing certain dramatic changes in structure which would seem to exacerbate the already difficult problem of completing college. The fastest growing segment of the system, for example, is the two-year and community colleges--institutions which appear to reduce the student's chances of completion. At the same time, the private sector appears to be experiencing declining enrollments or, at best, holding its own. To compound the problem further, there is a tendency for public colleges to grow

in size, and for many institutions to abandon residential requirements and even to divest themselves altogether of residential facilities.

In short, these trends in both student enrollments as well as institutional structure are likely to accelerate the continuing spiral in college attrition rates unless appropriate remedial procedures are instituted. Since most public systems of higher education are perhaps irrevocably committed to a policy of open access, attempting to change the nature of the student clientele entering the system would seem fruitless. Indeed, such attempts would run counter to the basic philosophy of expanding access which has now been endorsed by most state legislatures and, for that matter, by most persons of influence in the higher education establishment. What seems to be needed, then, is a concerted attempt to bring about structural alterations in the higher education system which will increase the student's chances of completion--and in this case there would be a special concern with the chances of the high-risk or dropout-prone student, which are significantly poorer to begin with.

While there is clearly no deus ex machina or other panacea that comes immediately to mind, our data suggest several remedial activities which might well be considered. To begin with, it would seem that a greater bang for the financial aid buck could be achieved by concentrating more of our existing resources in scholarships rather than in other forms of financial aid. While the trend toward increasing enrollments in two-year and community colleges is perhaps inexorable, such institutions might well want to consider the possibility of instituting special programs to assist the academically-oriented student in his efforts to continue beyond the associate level and to facilitate the transfer process. The point of all of this is that our data show that, even among students who initially say

they are aspiring to at least the baccalaureate degree, their chances of actually achieving this objective are less if they begin their undergraduate education in a two-year or community college rather than a four-year college or university. At the same time, institutions that are considering abandoning residential facilities might want to take a second look at the possible educational value of such facilities. Furthermore, institutions that have abandoned residency requirements for freshmen, or who are considering abandoning such requirements, may want to reexamine such a policy in light of our data. At a higher policy level, state and national legislators might want to reconsider the current trend toward withdrawal of support for construction of residential facilities.

One reality that researchers must face sooner or later is that administrators and policy-makers are not sitting around anxiously awaiting the results of the latest research project so that they will be able to make better informed decisions. The blunt truth of the matter is that most administrators have little interest in relating the results of research to their own decisions, and those few who do are usually interested more in gaining support for current policies than in having their minds changed.

One source of this difficulty is the poor track record of educational research so far. Typically, researchers have succeeded in turning off the practitioner by doing studies that are either too complicated, and therefore incomprehensivle, or so esoteric that they are seen as irrelevant. Many administrators who might otherwise be sympathetic to a research-based approach to decision-making have thus been conditioned not to expect much from higher education research.

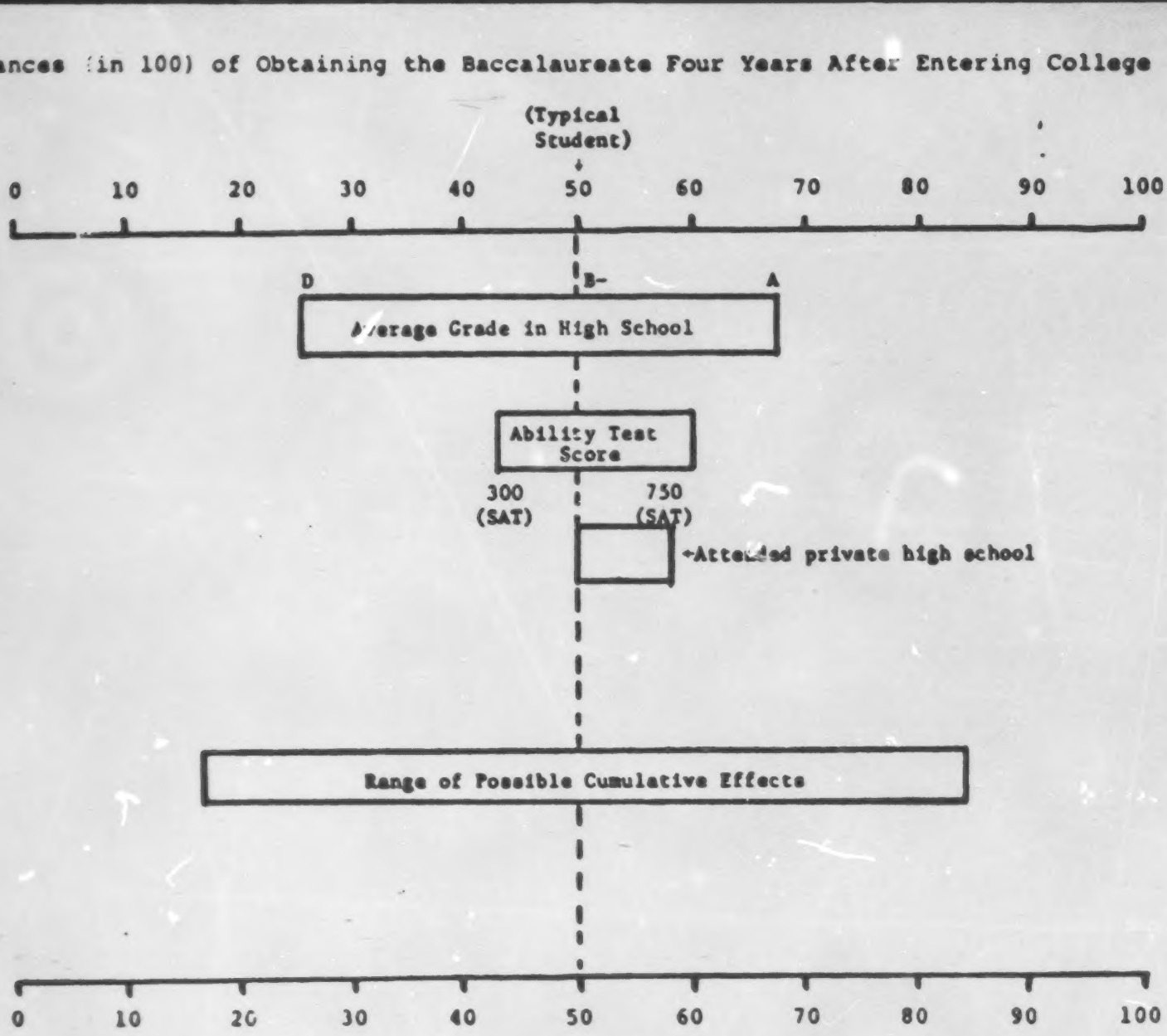
Another difficulty lies in the nature of the decision-making process itself. Occasions continually arise that force the administrator to commit

himself to one or another alternative, regardless of whether or not he has an adequate base of information. The very act of deciding, of choosing an alternative, puts the administrator in a position of having to rationalize and defend his decision.

This problem is further compounded by the inherent methodological frailties of educational research. Because of the great complexity of most educational problems, and the practical constraints against laboratory experimentation, the results of most educational research are subject to several alternative--and possibly contradictory--interpretations. This is not to say that there are not degrees of confidence that one can assign to particular interpretations or that all educational research is hopelessly ambiguous, but simply to emphasize that virtually any study is vulnerable to methodological criticism. The real issue, it seems to me, is for administrators to secure highly competent reviews of each study by persons who have no vested interest in the outcome, in order to determine how much confidence can be placed in the results.

These twin problems of administrative bias and methodological limitations of educational research make a kind of unholy alliance. A well-designed or well-controlled study, for example, can easily be rejected because of some minor flaw if the results run counter to the decision-maker's preconceived notions. By the same token, if the results of a poorly-designed study confirm the administrator's biases, they may be accepted uncritically. In short, without some independent and disinterested appraisal of the validity of the findings, the results of higher education research are not likely to have much impact on the decision-making process.

If there were some reason to believe that decision-makers would be inclined to use it, I and my colleagues might be tempted to develop the sort of Buck Rogers decision-oriented information retrieval system that I mentioned earlier. One obstacle here, of course, is that the day-to-day pressures confronting most college administrators make it difficult for them to think beyond the relatively immediate problems of fund raising, budgeting, faculty and student political pressures, recruitment and hiring, and state and national legislative activity. The real question, then, is whether administrators can be persuaded to view their alternatives more in terms of their longer-range consequences for students. If this can be accomplished, then research-based decision-making of the kind that I have envisioned here could well become a reality.


Chances (in 100) of Obtaining the Baccalaureate Four Years After Entering College
(Typical Student)
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B-
A
Average Grade in High School
Ability Test Score
300 (SAT)
750 (SAT)
Attended private high school
Range of Possible Cumulative Effects
0 10 20 30 40 50 60 70 80 90 100

Figure 1. Effects of Academic Background Characteristics on Persistence in College

Chances (in 100) of Obtaining the Baccalaureate Four Years After Entering College

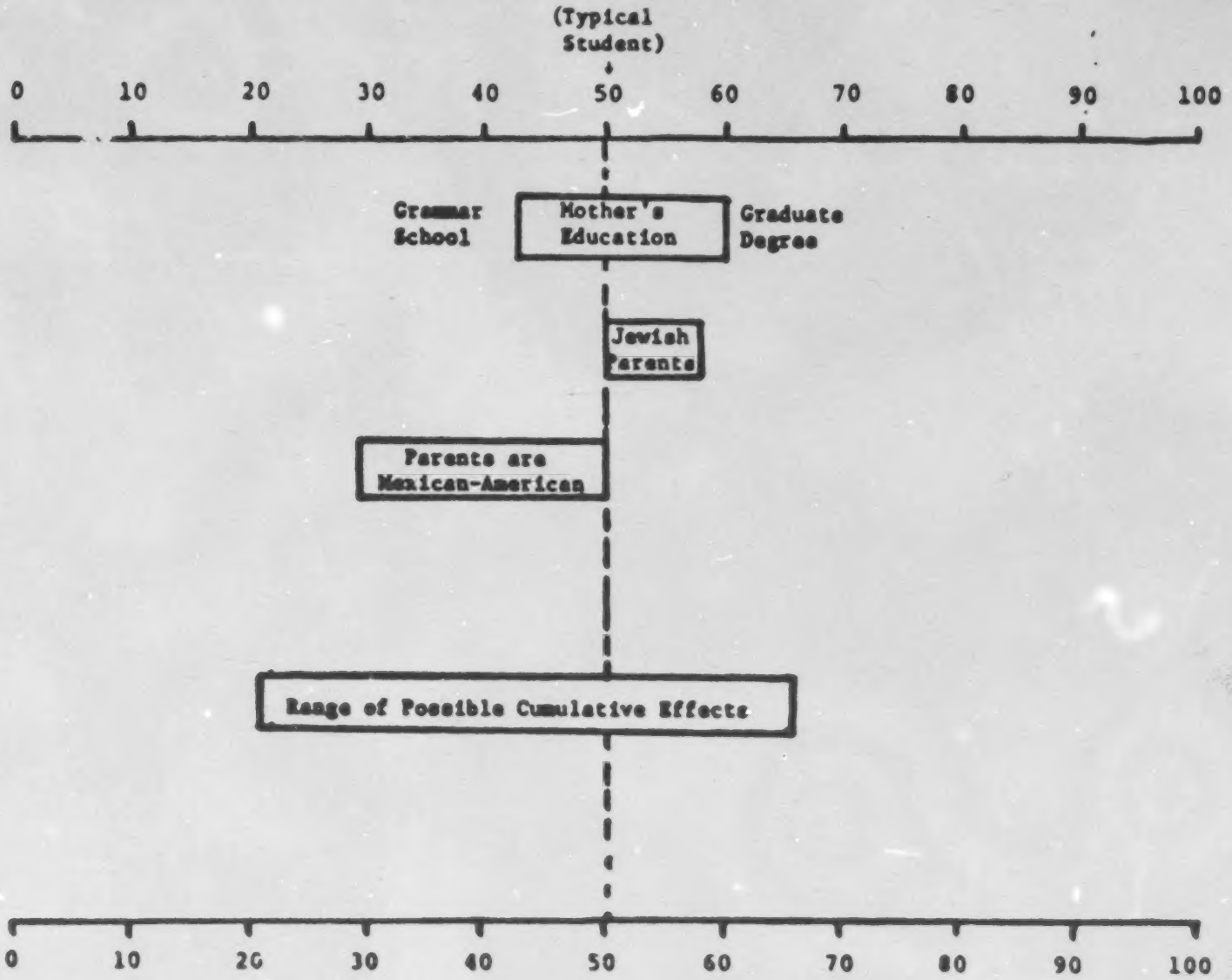

Figure 2. Effects of Family Background on Persistence in College

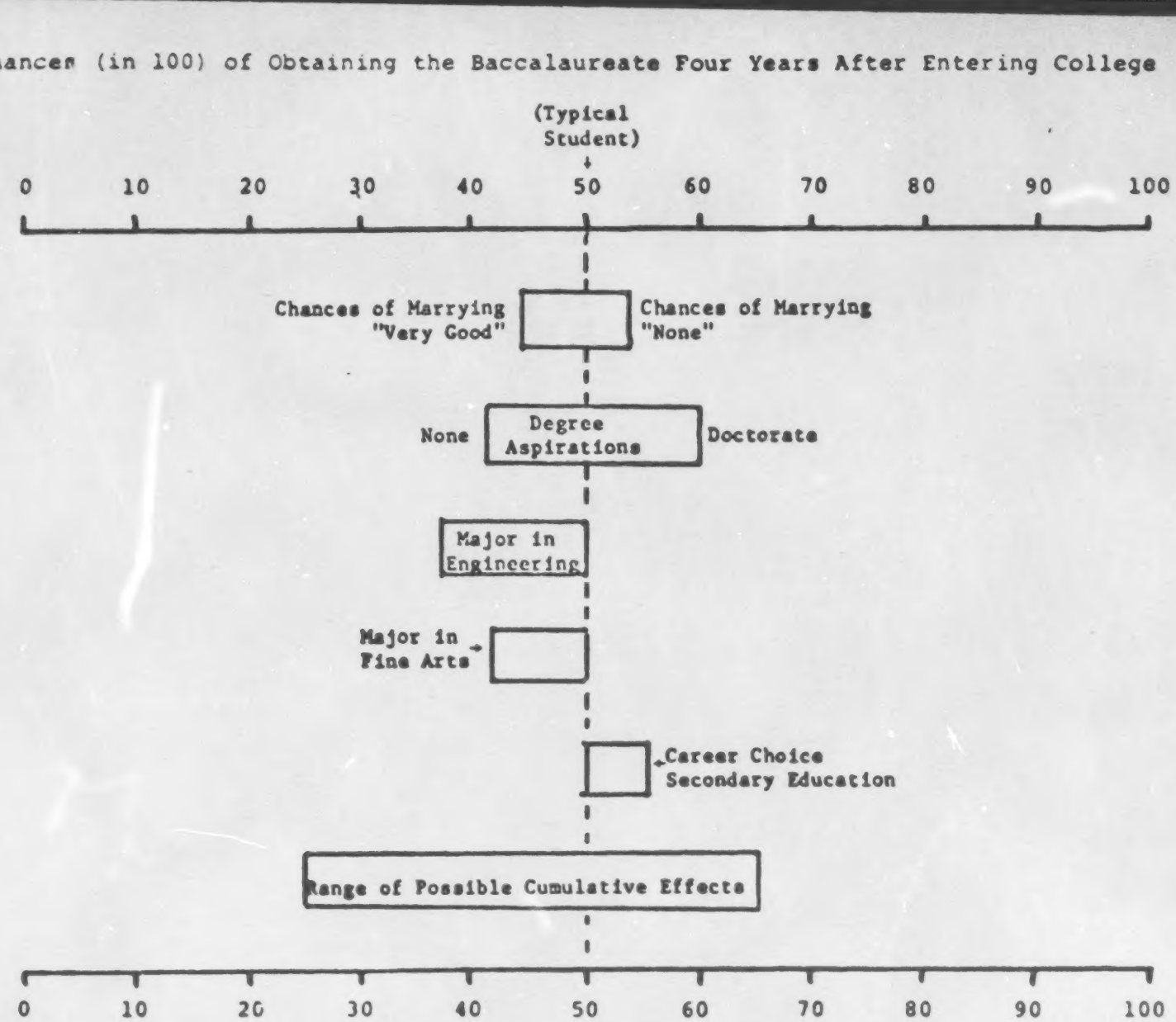

Figure 3. Effects of Plans and Aspirations on Persistence in College

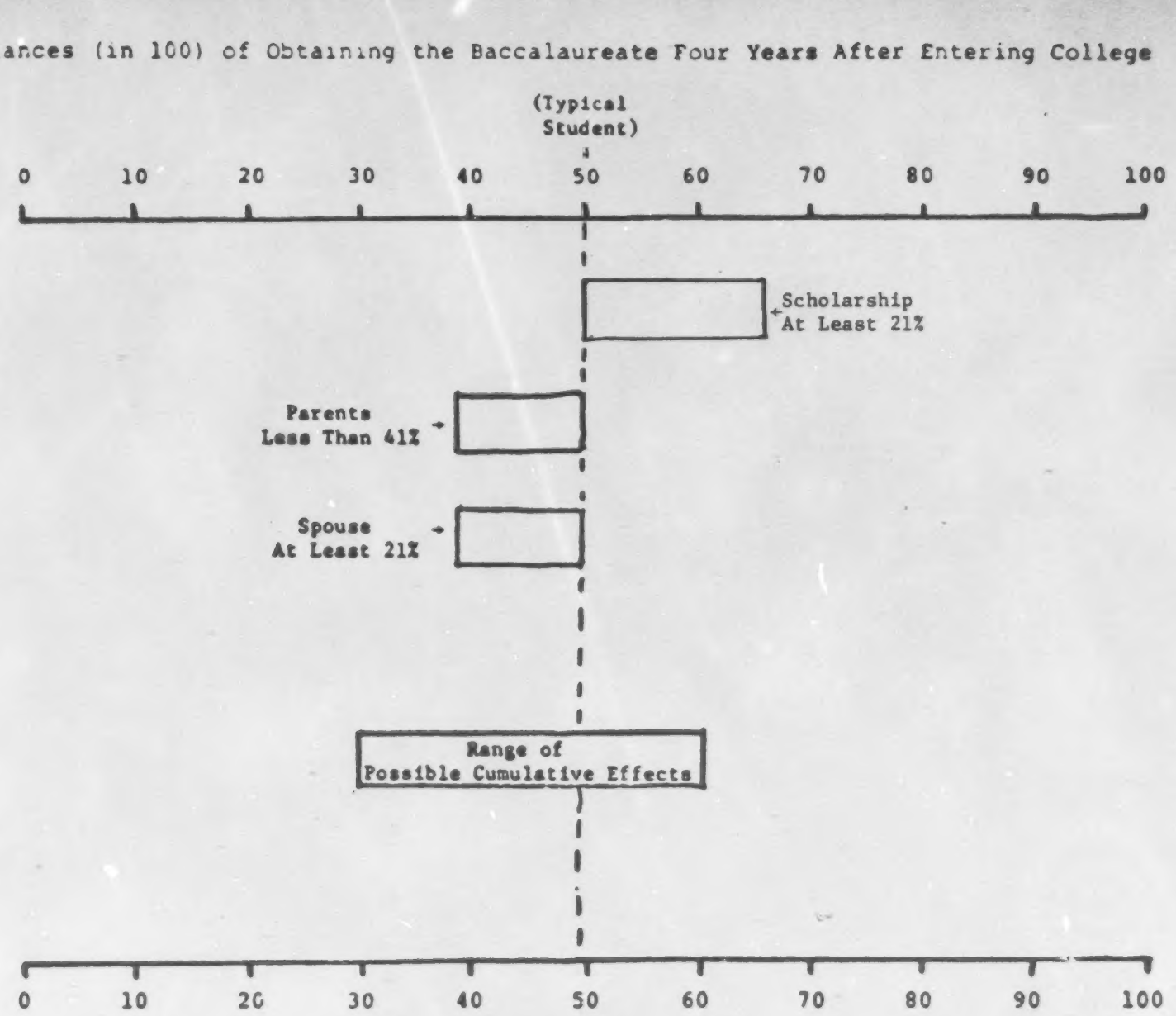

Figure 4. Effects of Mode of Financial Support on Persistence in College

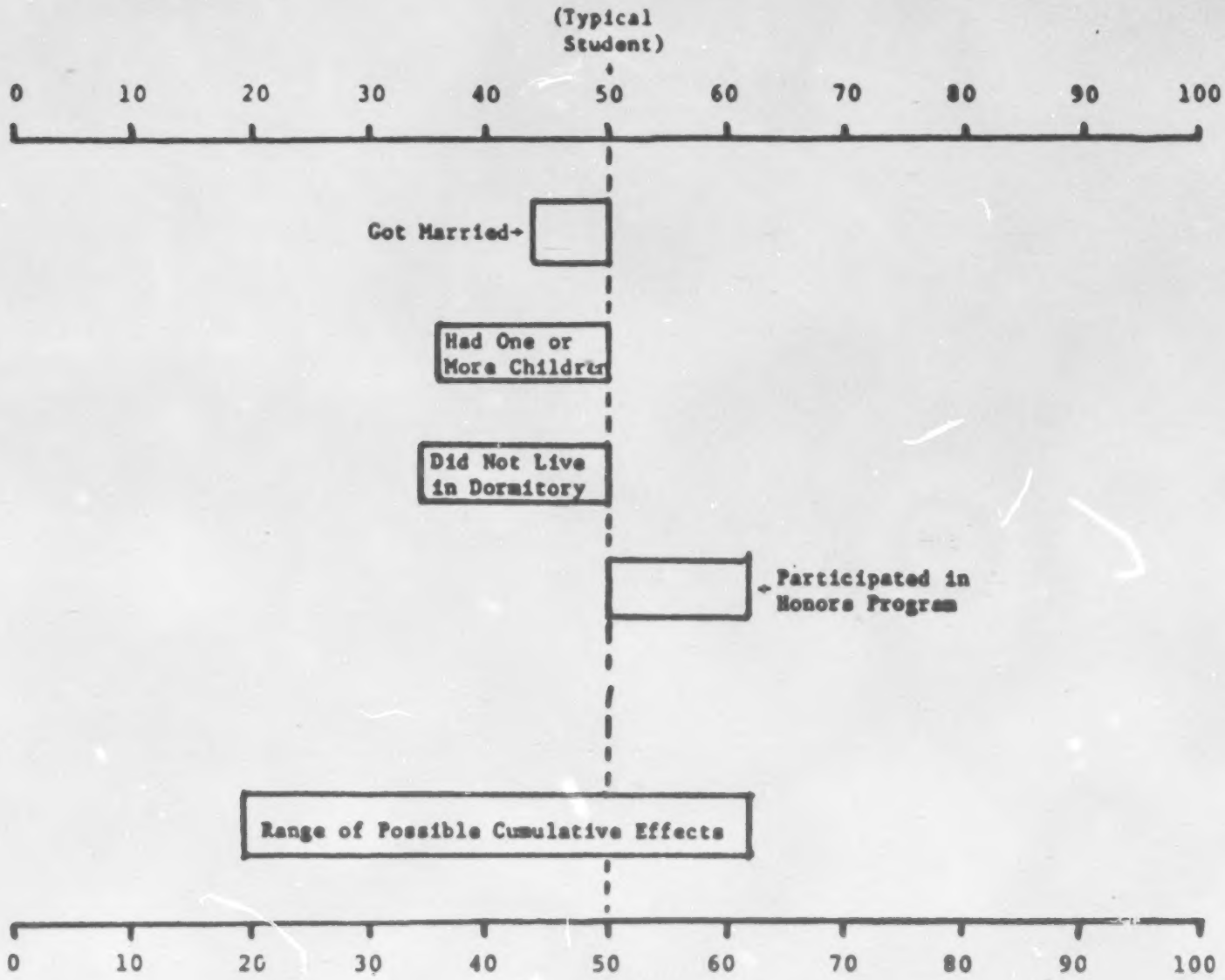

Figure 5. Effects of College Activities on Persistence in College

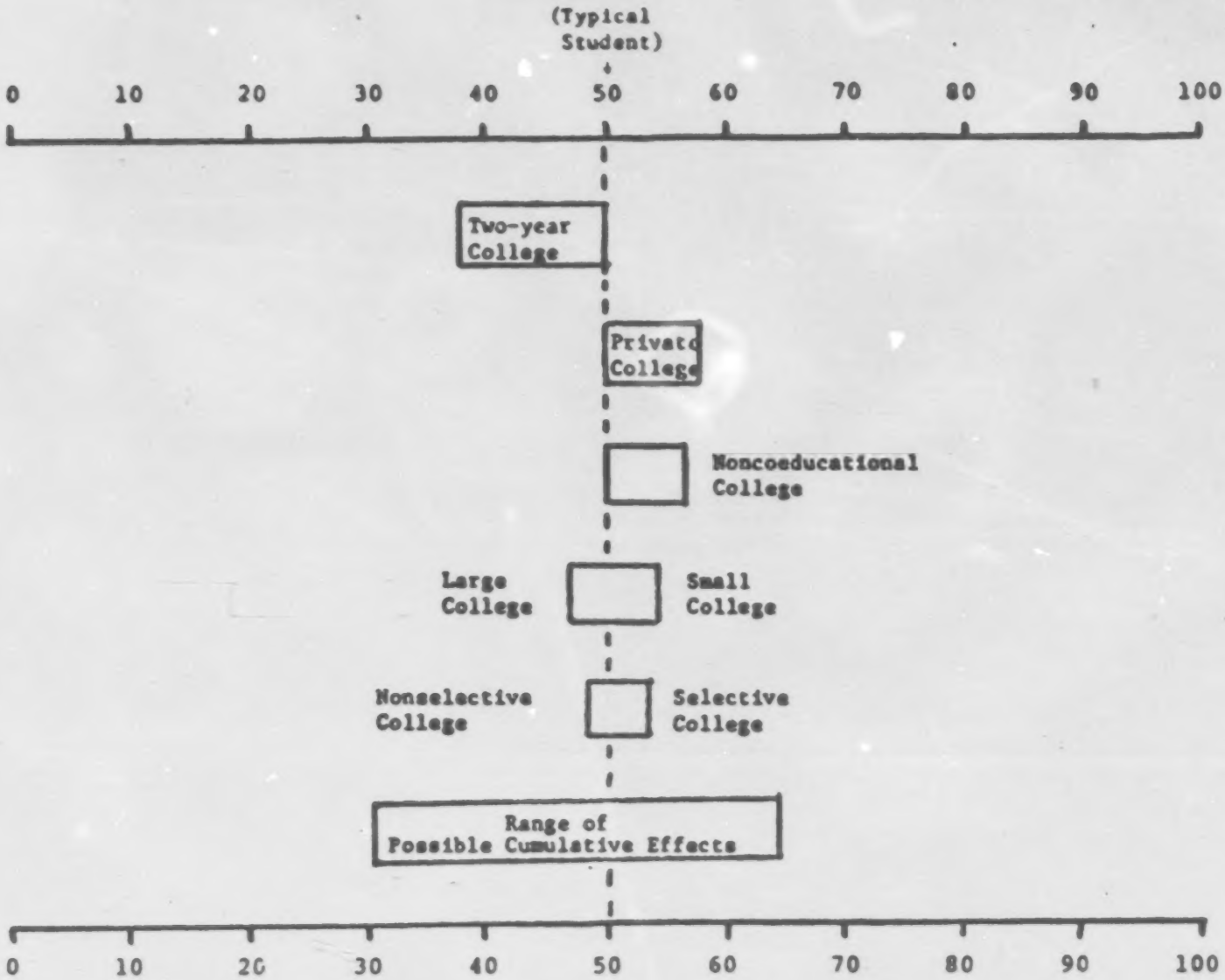

Figure 6. Effects of Type of College on Persistence in College

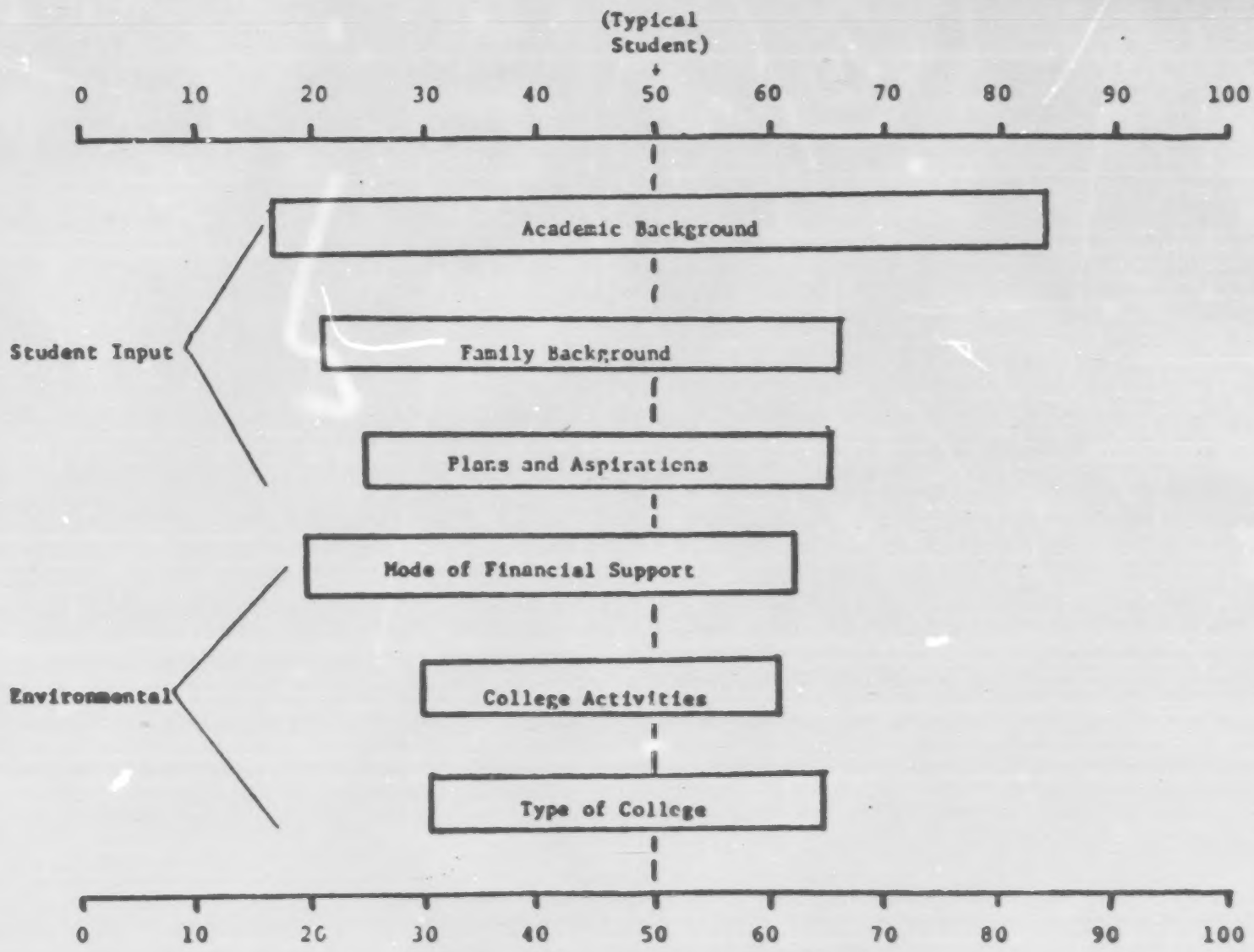
Chances (in 100) of Obtaining the Baccalaureate Four Years After Entering College
(Typical Student)
0 10 20 30 40 50 60 70 80 90 100
Academic Background
Student Input
Family Background
Plans and Aspirations
Mode of Financial Support
Environmental
College Activities
Type of College
0 10 20 30 40 50 60 70 80 90 100

Figure 7. Ranges of Possible Cumulative Effects of Various Types of Student Input and Environmental Factors on Student Persistence

Table 1

Summary of Environmental Alternatives Affecting the Student's Chances of Completing the Baccalaureate in Four Years

Alternative A (positive)	versus	Alternative B (negative)	Percentage Increase in Completion Rates* Between Alternatives A & B
Scholarship aid		No scholarship aid	15
Participate in honors program		Not participate in honors program	10
Live in dormitory (first year)		Live at home (first year)	8
Four-year college		Two-year college	18
Small college		Large college	7

*After control for student input variables.

Table 2

Effects of Dormitory Living by Type of Institution

During Freshman Year Lived In:	Actual Rate of Degree Completion Minus Estimated* Rates in: (Percentages)		
	Two-Year Colleges	Four-Year Colleges	Universities
Dormitory	-16	+9	+3
Private room	-12	+9	-3
With parents	-12	+2	-6

*On the basis of student input characteristics.

Table 3

Payoff Rates, in Terms of Increases in Degree Completion Rates, of Various Decision Alternatives, Under Various Constraints

Decision (Constraint)	Increase in Percentage Completing Degree in Four Years
Dormitory living versus private room (in university)	+ 6
Dormitory living versus private room (in four-year college)	0
Dormitory living versus private room (in two-year college)	- 4
Dormitory living versus living with parents (in university)	+ 9
Dormitory living versus living with parents (in four-year college)	+ 8
Dormitory living versus living with parents (in two-year college)	- 4
Private room versus living with parents (in university)	+ 4
Private room versus living with parents (in four-year college)	+ 7
Private room versus living with parents (in two-year college)	0
Four-year college versus university (live in dormitory)	+ 6
Four-year college versus university (live in private room)	+11
Four-year college versus university (live with parents)	+ 8
Four-year college versus two-year college (live in dormitory)	+25
Four-year college versus two-year college (live in private room)	+20
Four-year college versus two-year college (live with parents)	+13
University versus two-year college (live in dormitory)	+18
University versus two-year college (live in private room)	+ 9
University versus two-year college (live with parents)	+ 6

Table 4

Side Effects of a Decision to Require Freshmen to Live on Campus

A. Educational Progress

Increase in:

Percentage who get the baccalaureate in four years

Percentage who apply for graduate study

GPA's

Decrease in:

Percentage who drop out

B. Educational Plans and Interests

Increase in:

Percentage majoring in education or social science

Percentage who want to become teachers or performing artists

Percentage who are undecided about a career

Decrease in:

Percentage majoring in business or engineering

C. Behavior

Increase in:

Drinking

Smoking

Listening to soul music

Dating, going to parties

Oversleeping and missing classes

Decrease in:

Attending Sunday School

Attending church

Driving cars

Gambling

(Continued)

Table 4 (Continued)

Side Effects of a Decision to Require Freshmen to Live on Campus

D. Values, Attitudes, and Self-Concept

Increase in:

Political liberalism

Self-concepts of: popularity, self-confidence, public speaking ability

Decrease in:

Political conservatism

E. Ratings of the College

Increase in:

Overall satisfaction

Personal contacts with faculty

Personal contacts with classmates

Opportunities to discuss work with professors

Advice and guidance from faculty and staff

Social life

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